MARKETING OF PETROLEUM PRODUCTS FOR THE AUTOMOBILE TRADE

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MARKETING OF PETROLEUM PRODUCTS

FOR THE AUTOMOBILE TRADE

RAYMOND E. PANNIER

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MARKETING OF PETROLEUM PRODUCTS FOR THE AUTOMOBILE TRADE.

CHAPTER 1. INTRODUCTION.

In any paper such as this is to be, it seems best to start with a definition of marketing. No one definition is acceptable to all students of marketing problems, but as we are not engaged here in the fine points of rule making, one definition will be given as that accepted as standard for this study at least. Marketing will here be considered as consisting of those efforts which effect transfers in ownership of goods and care for their physical distribution.[1]

When the petroleum industry is studied in the light of its influence on modern life, one cannot help but marvel at its far-reaching effects. The development of all industry and transportation to its present capacity would have been impossible without petroleum, both as a fuel and as a lubricant. Many other things which affect our daily health and comfort are by-products of the petroleum industry. For example, such items as the following are obtained from petroleum: medicine, salve, alcohol, solvents, road oil, pitch, carbon electrodes, candles, insecticides, and cleaning fluids. It is not with these matters, however, that this paper will deal.

1. Clark: "Principles of Marketing".

They are mentioned merely to bring to mind the fact that the oil industry would be an important one today even if the "horseless buggy" had never put in its appearance.

The growth of the automobile is one of the wonders of the twentieth century, and the part that the oil men have played in supplying the ever-increasing demand for the fuel that has permitted this growth cannot be overlooked. From being the most worthless of petroleum products, gasoline has become the most valuable. Refiners are bending every effort to get bigger production of gasoline, and the handling of the selling end of this huge business is what I propose to describe in the ensuing chapters.

Let us first turn, however, to the history of petroleum as a whole. The extent of its development is even more striking when one recalls the fact that the first oil well was drilled less than seventy years ago.[1] Oil was not an unknown article before Colonel Drake put through the first well in Pennsylvania in 1859, but practically the only way it was obtainable before that was through seepages or surface pools. The whaling industry had furnished the chief supply of illuminating and lubricating oils until then, but could not have begun to fill the growing industrial demand that grew up after the Civil War. As far as the automobile trade is concerned, no satisfactory substitute for gasoline has ever been discovered. The result is that after a life-time of connection with petroleum we find ourselves entirely

1. Victor Ross:"Evolution of the Oil Industry". Ch. 4

dependent on it in many ways.

In this introductory chapter, it seems proper to point out some of the peculiar conditions affecting marketing. In the first place, the whole industry is pervaded with uncertainty, due to the nature of the product itself. Oil is mined, and consequently its supply is uncertain and irregular. Periods of over-supply follow on the heels of periods of under-supply. This means shifting prices for crude oil. Such conditions are bound to affect the oil marketer, although, as we shall see later, the price of crude is but a small factor in the price of gasoline delivered to a customer's automobile tank.

In the second place, the wide and regular use of gasoline and oil brings the industry to the constant attention of a large part of the buying public. Wherever ownership changes hands, there is a chance for friction; and since sales in the gasoline business consist of a large number of small repeat orders, oil men are oftentimes subjected to severe criticism.

Still another of the peculiar conditions affecting the petroleum industry is the general distrust of "oil". This seems to be a hang-over from the favorite political sport of two and three decades ago. To be known as a "trust-buster" was the ambition of every Congressman, and some of the most concerted attacks were aimed at the "Standard Oil trust". What is left of the feeling against

the oil industry created at that time has not been calmed by the oil scandals of recent years. The oil man is popularly thought of as a profiteer, who is trying to squeeze everything he can out of the "common people". There are many good citizens who still fear the Standard Oil companies, and consider them as menaces to competition and to the so-called "Independent" companies. But the fact is that the decree of dissolution issued against the Standard Oil in 1911 has done its work. The different companies now operating in different parts of the country under the name of Standard have no corporate connection. Even their individual interests are often seen to be at odds.

Like practically all the large businesses of the country, the oil industry is threatened with the perpetual bugaboo of government intervention. Government co-operation in the gathering of petroleum statistics, and the creation by President Coolidge of the Federal Oil Conservation Board are wise steps. But such movements as the recent one in Tennessee to regulate the retail price of gasoline are not only uneconomic, but also unnecessary and unfair to an industry, which, as we are about to see, is troubled chiefly with its youth and inexperience.

CHAPTER 2. SUPPLY AND DEMAND

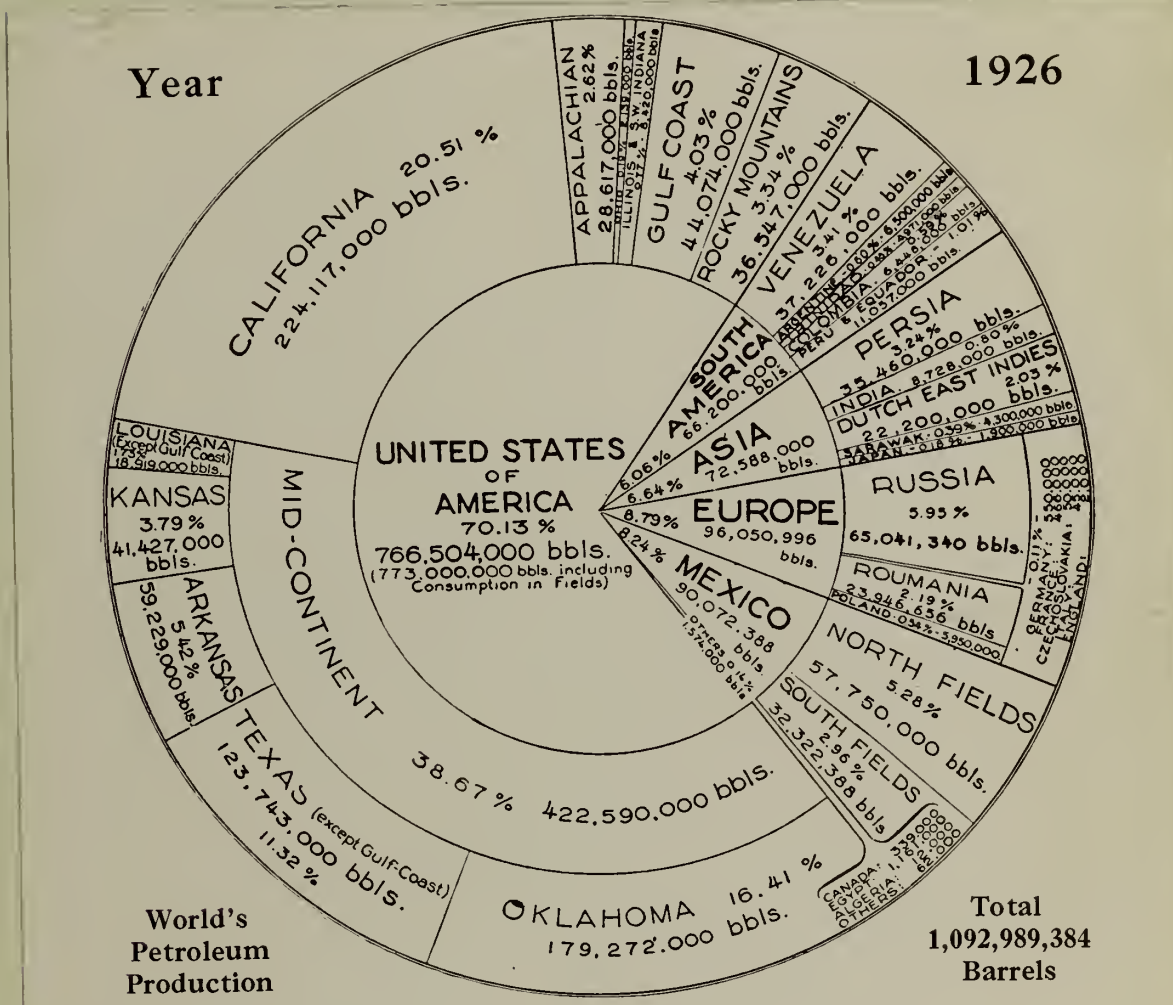
A survey of the market itself seems to be the first thing that is necessary in a study of this kind. It is for this reason that before describing the methods of getting gasoline to the consumer, an attempt will be made to ascertain the supply of and demand for gasoline.

A few preliminary statistics for the whole petroleum industry, without limiting oneself to gasoline will be valuable. The most striking aspect of figures on world petroleum production is the outstanding leadership held by the United States. This country produces about 70% of the world's supply of crude oil. Our nearest competitor before the world war was Russia, but since that time, Mexico has assumed second place. But Mexico is now producing only about 12% of the world's supply. The following table gives the world-wide production of petroleum for the years 1919-1925, with the amounts produced by the three leading nations, the United States, Mexico, and Russia:[1] (in thousands of bbls.) (of 42 U. S. gallons.)

Year	Total	U. S.	Mexico	Russia	% U.S.
1919	555,795	378,367	87,073	31,752	68
1920	688,804	442,929	157,069	25,430	64
1921	765,903	472,183	193,398	28,968	62
1922	858,909	557,531	182,278	35,692	65
1923	1,015,727	732,407	149,585	39,147	72
1924	1,014,160	713,940	139,678	45,355	70
1925	1,067,761	763,743	115,515	52,448	72

1. Bureau of Mines Report:"Petroleum in 1925". pp. 340-341

The pie chart given below is taken from "The Texaco Star" for September, 1927, and gives the world petroleum production for 1926. The relative position of the three leading countries in 1925 remained unchanged in 1926.


Year
1926
CALIFORNIA 20.51 % 224,117,000 bbls.
APPALACHIAN 2.62% 28,617,000 bbls.
GULF COAST 4.03% 44,074,000 bbls.
ROCKY MOUNTAINS 3.34% 36,547,000 bbls.
VENEZUELA 3.41 % 37,226,000 bbls.
SOUTH AMERICA 6.06% 66,200,000 bbls.
PERSIA 3.24% 35,460,000 bbls.
INDIA 0.80% 8,728,000 bbls.
DUTCH EAST INDIES 2.03 % 22,200,000 bbls.
ASIA 6.64% 72,588,000 bbls.
EUROPE 8.79% 96,050,996 bbls.
RUSSIA 5.95 % 65,041,340 bbls.
ROUMANIA 2.19% 23,946,636 bbls.
MEXICO 8.24% 90,072,388 bbls.
NORTH FIELDS 5.28% 57,750,000 bbls.
SOUTH FIELDS 2.96% 32,322,388 bbls.
UNITED STATES OF AMERICA 70.13 % 766,504,000 bbls. (773,000,000 bbls. including Consumption in Fields)
MID-CONTINENT 38.67 % 422,590,000 bbls.
TEXAS (except Gulf Coast) 123,743,000 bbls. 11.32 %
OKLAHOMA 16.41 % 179,272,000 bbls.
KANSAS 3.79% 41,427,000 bbls.
ARKANSAS 5.42% 59,229,000 bbls.
LOUISIANA (Except Gulf Coast) 1.73% 18,919,000 bbls.
World's Petroleum Production
Total 1,092,989,384 Barrels

Estimates of 1927 production show the United States as still producing over 70% of the crude oil. Figures covering the same heading as those given on the preceding page are given below. These are taken from an estimate made by Mr. V. R. Garfias, who as manager

of the foreign oil department of H. L. Doherty & Co., is in a good position to form an opinion on this subject.[1]

Total world production for 1927	1,229,500
Production in United States	890,000
Production in Russia	70,000
Production in Mexico	63,000
Production in Venezuela	60,000
Per cent produced in United States ..	72%

These figures are also given in thousands of barrels of 42 U. S. gallons. The fact that Mexican production has dropped off sharply since its peak in 1921, the re-capture of second place in production by Russia, and the coming of Venezuela into the world oil picture are the outstanding features brought forth in these figures.

Of course, such a leadership held by the United States is gratifying. But to many who are looking ahead to future years, it is also a source of worry. The supply of any mined product, like petroleum, is always a mystery. From what part of the world will the supply come if or when the American fields lose their productivity and wild-catting here fails to develop new fields? A still more pertinent question is who will control this supply? The future of the automobile is not the most important thing involved, but the future of American industry, with the comforts, the luxuries, and the "prosperity" it brings is vitally affected. As suggested in the opening chapter, the influence of petroleum is so far-reaching, it is difficult for the mind to grasp the immense power that

1. National Petroleum News, Oct. 12, 1927.

is in the hands of any nation that controls a large proportion of this article so essential to modern industry. The American government has been urged to protect its oil companies in their foreign ventures so that the predominance of this country in petroleum production may not be lost. Much has been written on this subject,[1] but it is not within the scope of this paper to do more than mention it.

In order to get an idea of the domestic demand for and supply of crude petroleum, the table on page nine is inserted. Figures for 1924, 1925, and 1926 are included, 1927 figures being omitted because they are not yet available. Although the United States both imports and exports crude and refined petroleum, the figures show that this country is at present self-sufficient as far as its own demand for oil is concerned. In each of these three years, the domestic production of crude oil exceeded the domestic demand, in 1924 by 50,000,000 barrels, in 1925 by 65,000,000 barrels, and in 1926 by 25,000,000 barrels. Preliminary figures for 1927 bear out the estimate given on page six and indicate recovery during the past year from

1. A very interesting discussion of the struggle for new oil fields is contained in Isaac Marcosson's book "The Black Golconda". The Federal Trade Commission made a report in 1923 on "Foreign Ownership in the Petroleum Industry". This deals with foreign companies operating in the United States, and gives a good summary of the world-wide operations of the leading foreign company, the Royal Dutch Shell. It also contains the restrictions existing in various countries in 1923 against foreign operation of their oil fields.

SUMMARY OF SUPPLY AND DEMAND OF ALL OILS

(In thousands of barrels of 42 U. S. gallons)

SOURCES: 1924 and 1925 from "Petroleum in 1925", pp. 313-4, published by the Bureau of Mines. 1926 from "Preliminary Summary of Petroleum Statistics, 1926 p.4, published by the Bureau of Mines.)

SUPPLY	1924		1925		1926	
Production		713,940		763,743		766,504
Imports						
Crude	77,775		61,824		60,384	
Refined	16,806	94,581	16,376	78,200	20,938	81,322
Total new supply		808,521		841,943		847,826
DEMAND						
Total		780,440		811,847		872,908
Exports						
Crude	18,239		13,337		15,406	
Refined	98,728	116,967	100,216	113,553	116,147	131,553
Domestic demand		663,473		698,294		741,355
Excess of production over demand; Daily Average		138		179		69

the 1926 slump in the margin of production over consumption. A newspaper review of petroleum in 1927 credits Mr. W. C. Teagle, President of the Standard Oil Company (New Jersey) with the statement that although there was a gain in crude consumption during the last year of 46,000,000 barrels, this was more than offset by an increase in production of 140,000,000 barrels.*

Thus, it is clear that at the present time there is no great danger of a petroleum famine. The supply of lubricating and fuel oil for industry, railroads, and merchant marines, and what is more important for this paper, the supply of gasoline and lubricating oil for the gasoline trade, is assured for the time being at least. As predictions on the future supply of any mineral product can be little better than guesses, I do not consider it necessary to deal with them here.

Because of this question of the future of the petroleum supply, conservation of oil is a subject that has been attracting more and more attention. The Federal Oil Conservation Board appointed some time ago by President Coolidge looks for an effective conservation program within the oil industry without the necessity of government interference. In its latest report, it points out two promising signs:[1] First, the hiring by the larger oil companies of highly trained engineers to carry on research in methods of drilling, storing, refining and other such problems; second, the favorable attitude of the technical and trade press toward

1. This report is given in full in the "Petroleum Marketer", January 25, 1928.

* Springfield Republican, Jan. 1, 1928

conservation. The Board is now urging two constructive methods of conservation. One is better carburetor adjustment, which seems like a small point to raise. But the American Petroleum Institute tells us that the average automobile and truck engine is burning only 70% of the fuel fed to it; in other words, the mixtures used are too "rich".[1] The other method suggested is co-operation between the oil and automotive industries in the development of high compression engines and of the necessary special fuel.

Let us turn to a consideration of the supply of and demand for the actual product that we are studying. The necessary material is found in the statistics on gasoline production and consumption for the years 1919 to 1926 given on page twelve. The amazing increase in the demand for gasoline and the ability of the refiners to turn out the necessary supply are the features that stand out in this table. Within the short span of seven years the American public tripled its consumption of gasoline. These figures serve to explain the unsettled conditions which we shall find in the gasoline marketing business. What else could one expect in an industry which has grown from nothing to one of such proportions as the table indicates, all within a period of thirty years?

Gasoline has always been a problem to the petroleum industry. For fifty years after the drilling of the first oil well in 1859, the question was how to rid oneself of the naphtha and gasoline that had to be distilled before what was then the principal product of the

1. "What Makes the Old Bus Go", Question 12.

crude - "coal oil" or kerosene - could be obtained. Gasoline was then a nuisance that the refiner poured off at night into creeks, for this was the cheapest and safest way of dispensing with a useless by-product. Now the gasoline problem has become one of getting more and more of this first distillate from the crude oil in order to meet the demand that has come about as the result of the invention and development of the internal combustion engine.

This chapter would not be complete without reference to the automobile, which alone accounts for almost the entire present day consumption of gasoline. In fact, the growth in the use of the automobile and in the demand for gasoline have of necessity run hand in hand. Although the last eight or ten years have been the most significant in the development of gasoline marketing methods, I have included in the table on page fifteen the growth in automobile registrations from the beginning of the industry to the present time. In the years 1919 to 1926, during which time, as we have seen, gasoline consumption increased three times, automobile registrations grew in almost the same ratio. The graph on page sixteen also illustrates the parallel growth of these two items.

However uncertain predictions concerning the future of the petroleum supply may be, there is no uncertainty about the future of the demand. It is estimated that there is a world-wide investment in automobiles and

GASOLINE STATISTICS

(In thousands of barrel of 42 U. S. gallons)

Sources: 1919 to 1925 from "Petroleum of 1925", p. 378, published by The Bureau of Mines. 1926 from "Preliminary Summary of Petroleum Statistics", 1926, p. 4., published by The Bureau of Mines.

	1919	1920	1921	1922	1923	1924	1925	1926
Produced	94,235	116,251	112,704	147,672	179,903	213,326	259,061	299,734
Imported	203	964	900	1,479	4,555	3,453	3,813	6,052
Exported	9,097	15,636	18,134	14,156	20,741	28,967	31,497	43,473
Consumed	81,783	101,208	107,525	127,906	156,746	185,003	223,865	262,165
Stocks at refineries at end of year	10,638	11,009	13,954	21,043	28,014	30,823	38,875	39,023

[illegible]

other gasoline consuming machines of about $25,000,000,000.[1] This investment must be supplied with fuel to make it run, otherwise it is worth nothing. The importance of this fact cannot be over-estimated in considering the future of supply. Petroleum may be hard to find, but with such a market awaiting the producer, it seems almost safe to say that it will be found.

1. "Texaco Star", March 1927, p. 1.

GROWTH IN REGISTRATION OF PASSENGER CARS AND TRUCKS

1895	4	
1896	16	
1897	90	
1898	800	
1899	3,200	
1900	8,000	
1901	14,800	
1902	23,000	
1903	32,920	
1904	54,590	410
1905	77,400	600
1906	105,900	1,100
1907	140,300	1,700
1908	194,400	3,100
1909	305,950	6,050
1910	458,500	10,000
1911	619,500	20,000
1912	902,600	41,400
1913	1,194,262	63,800
1914	1,625,739	85,600
1915	2,309,666	136,000
1916	3,297,996	215,000
1917	4,657,340	326,000
1918	5,621,617	525,000
1919	6,771,074	794,372
1920	8,225,859	1,006,082
1921	9,346,195	1,118,520
1922	10,864,128	1,375,725
1923	13,479,608	1,612,569
1924	15,460,649	2,134,724
1925	17,512,638	2,441,709
1926	19,237,171	2,764,222
1927	20,333,988	2,968,680

Table taken from "Facts and Figures of the Automobile Industry, 1927 Edition", published by the National Automobile Chamber of Commerce, p. 4. Figures for 1927 from National Petroleum News, February 1, 1928.

Wooden IX Construction by [illegible]

[illegible]

Growth in Automobile Registrations, 1907-1927
automobiles
22,000,000
20,000,000
18,000,000
16,000,000
14,000,000
12,000,000
10,000,000
8,000,000
6,000,000
4,000,000
2,000,000
1907
1908
1909
1910
1911
1912
1913
1914
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1918
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1920
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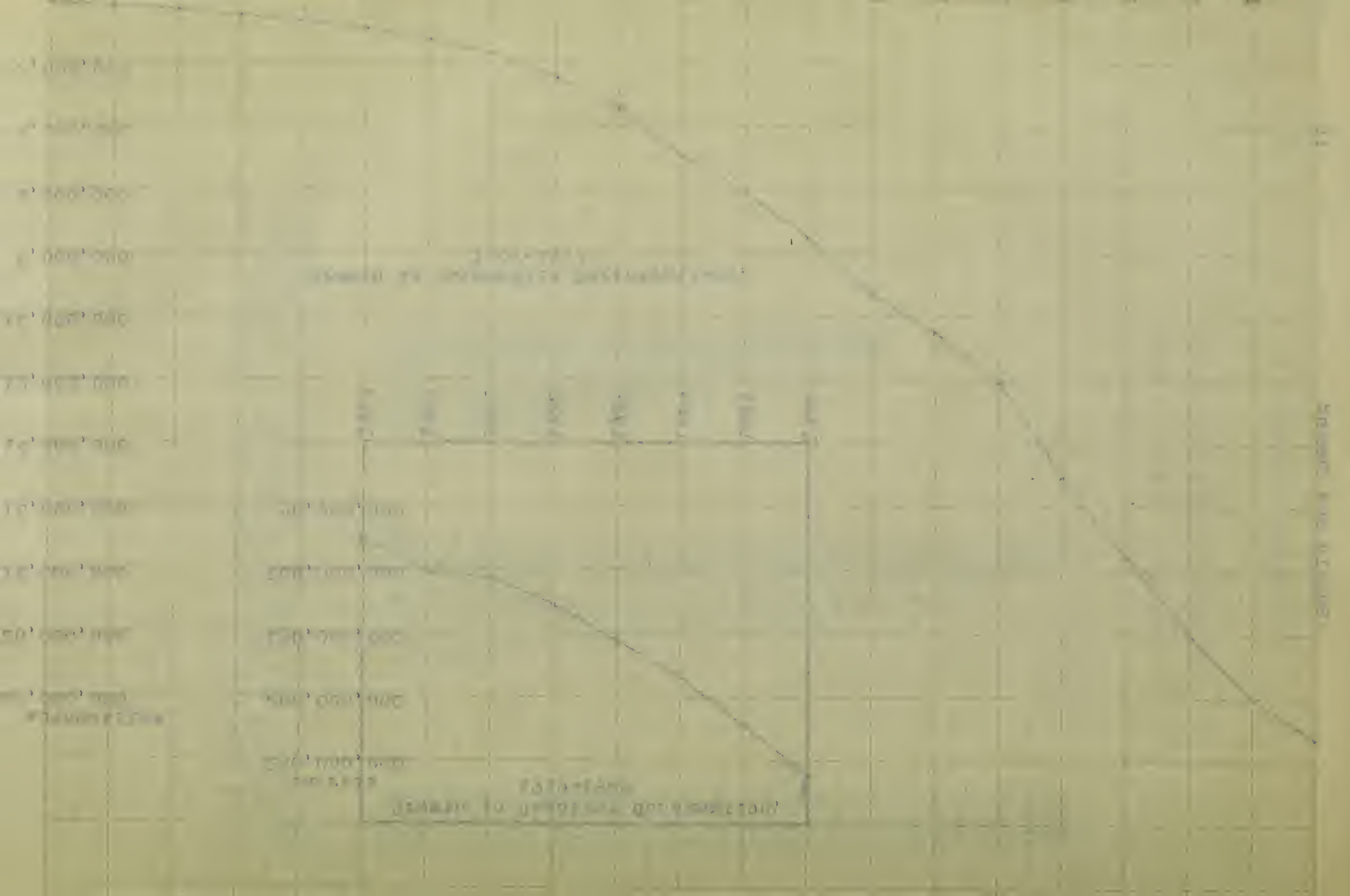
1922
1923
1924
1925
1926
1927
Growth in Gasoline Consumption, 1919-1926
barrels
250,000,000
200,000,000
150,000,000
100,000,000
50,000,000
1919
1920
1921
1922
1923
1924
1925
1926



CHAPTER 3. PRODUCTION AND REFINING

In order to give a better understanding of the uncertainties and complexities that underlie petroleum marketing, a brief chapter on the productive processes will be included here. As has already been pointed out, the great uncertainty in the petroleum industry starts with the drilling process. The term "wild-catting" has already been used, and means the drilling of new holes in untested areas. Wild-catting can never be entirely eliminated, for it seems very doubtful if tests will ever be invented for establishing beyond a doubt the presence of petroleum in any one spot. Of course, in the case of a few wells, many signs point to the existence of oil before drilling is started. The growing importance of geology in well drilling cannot be denied. Yet the fact remains that wild-catting must go on in order to develop new fields fast enough to meet the demand for petroleum.

This is an expensive process. Writing in 1920, Victor Ross stated that modern wells,[1] the depth of which is around 3,000 feet, cost about $50,000. Wells costing several times this amount are not unusual.[2] At this price,

1. Victor Ross: "Evolution of the Oil Industry", p. 75.

2. The American Petroleum Institute, in its booklet entitled "What Makes the Old Bus Go", gives some interesting figures regarding the cost of well-drilling in its answer to Question 43. The wells now used, being deeper than those of a few years ago, cost between $65,000 and $75,000. Costs increase in much greater ratio than mere proportion to depth.

even if every well struck oil, it would be expensive. Between one-fourth and one-fifth of the wells drilled, however, turn out to be dry holes. The following table of well-drilling results demonstrates this fact:[1]

Year	Wells Completed	Dry Holes No.	Dry Holes %
1921	21,937	5,160	23.9
1922	24,689	5,332	21.6
1923	24,438	5,883	24.1
1924	21,888	5,044	23.0
1925	25,623	6,734	26.3

Another feature of oil well drilling which affects the entire industry is the fact that it is always competitive. Once oil is struck, every one in that vicinity starts drilling, with the result that the market is soon flooded with crude. Field after field has been brought in in this way. Of course, it is only human nature. But the waste involved in a system requiring so much duplication of effort is apparent. Some of the California fields have been noted for their building lot drilling. Every city lot had its oil well, giving the area an appearance of a forest of derricks.

1. "Petroleum in 1925", p. 368. (Bureau of Mines).

were it study well attend [illegible] to county in compensation. Between [illegible]-County and Municipality of the Delta Utility, however, have not to be duly noted. The following table of Small-Utility Electric Consumers [illegible]:

Year	Delta Customers	[illegible]
1980	27,000	[illegible]
1981	28,000	[illegible]
1982	29,400	[illegible]
1983	31,000	[illegible]
1984	32,500	[illegible]

Another feature of all this [illegible] which affects the public industry is the fact that it is always [illegible]. Some are in [illegible], every one is made electric utility facility, even the small [illegible] be seen [illegible] area. Even after [illegible] there [illegible] is no [illegible]. If course, it is not [illegible] for the state [illegible] to [illegible] [illegible] municipality or [illegible] municipality of course it appears. Some of the [illegible] Please note that [illegible] Public Utility [illegible] Delta city [illegible] the [illegible] will [illegible] [illegible] [illegible]

Yet, conservation is a difficult thing to accomplish. Co-operation of drillers is the obvious answer, but producing companies hesitate to join hands for fear of violating the anti-trust laws. A revision of these laws has been urged by some oil men, but others have argued that the oil industry be kept out of politics as far as possible. During the last year, more or less spasmodic attempts have been made at co-operative drilling in the Seminole field, but without any far-reaching results.

After the oil has been taken from the ground, the next step in obtaining a marketable product is the refining process. Generally speaking, there are four different classes of distillates which come from crude oil. They are separated from each other by the process of heating the petroleum gradually, and condensing the vapor as it comes off. Naturally, the first vapor to form is that of the most volatile of petroleum by-products, which is gasoline. As the crude becomes hotter, all the gasoline has been boiled out, and the second distillate, kerosene, appears. Still later, the gas and fuel oil is distilled, leaving the heavy lubricating oils for the last. Of course, there is no distinct dividing line between each distillate. The skill of the refinery operators, the make-up of the crude, and the type of distillates desired largely govern the "end-points", or the degree of temperature at which it is decided to change from one by-product to the next.

The immense demand for gasoline resulted some fifteen years ago in the invention of another manufacturing method, that known as "cracking". This is a process whereby the fuel and gas oil is subjected to intense heat under high pressure. In this way, the larger molecules are broken down into smaller, more volatile ones, and the resulting vapor is converted into gasoline. The American Petroleum Institute declares[1] that "without the supply of cracked gasoline, automobile use could not have expanded to its present proportions for the lack of fuel. Cracked gasoline supplied the fuel for 8,600,000 motor vehicles in 1926. Cracking provides one of the greatest safety measures against a shortage of gasoline."

Cracking has made it possible to secure a much larger yield of gasoline per barrel of crude oil than was formerly obtained. In 1927, the American Petroleum Institute published the following statistics regarding the average yield of a 42 gallon barrel of crude:[2]

Gasoline	14.8 gals.	(35.24%)
Kerosene	3.3 gals.	(7.86%)
Gas & Fuel Oil	19.6 gals.	(46.67%)
Lube Oil	1.7 gals.	(4.05%)

The balance is asphalt, coke and loss.

The large increase in the proportion of gasoline distilled just during the last ten years is shown by figures similar

1. "What Makes the Old Bus Go", Question 41.
2. ibid, Question 21.

[illegible] [illegible] [illegible]
[illegible] [illegible] [illegible]
[illegible] [illegible] [illegible]

to the foregoing but for the year 1918:[1]

Gasoline	23.47%
Kerosene	12.00%
Gas and Fuel Oil	48.16%
Lubricants	5.54%

The accompanying chart gives in a simplified way a picture of the refining and cracking processes.[2]

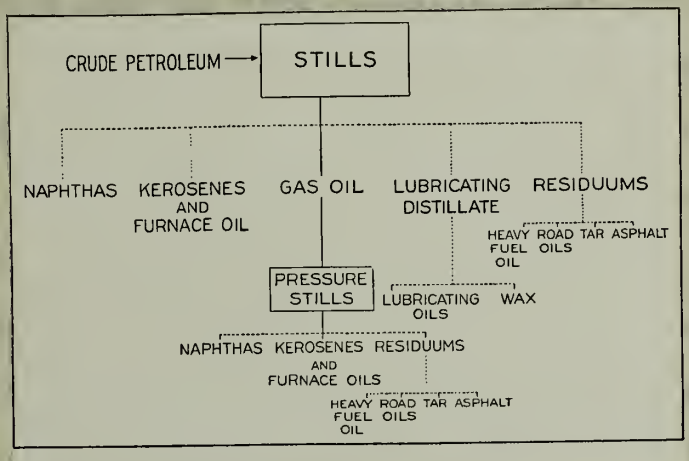


Chart of Some of the Principal Petroleum Products

Another type of gasoline which serves to fill the demand for this product is known as natural gas or casinghead gasoline. The gas which escapes from the casinghead of a well (hence the name) is caught, and by absorption and compression processes, the extremely volatile gasoline which exists in it in vapor form is obtained. This is ordinarily used in two ways: first, it may be blended with ordinary gasoline of low volatility; or, secondly, it may be used in high compression airplane motors. The natural gasoline production is increasing

1. Report of the Federal Trade Commission: "The Advance in Price of Petroleum Products." 1920. P. 33.
2. Standard Oil Company of Indiana booklet "The Story of Petroleum", p. 11.

rapidly, and is becoming more important each year. Following are the figures for the last three years:[1]

1925	300,881,150 gallons
1926	389,366,377 gallons
1927	480,000,000 gallons (estimated)

As still another source of possible petroleum supply there are the vast deposits of oil shales in this country. The report of the Federal Oil Conservation Board mentioned on page ten estimates that if and when the price of oil warrants its extraction there are 92,000,000,000 barrels of recoverable oil in these shales. This is nearly ten times the total quantity of well oil produced to date in the United States. The cost of extracting this oil is prohibitive at the present time, but if the supply is ever needed, the price will undoubtedly adjust itself.

After gasoline has been refined in one of the various methods described above, one thing still remains to be done before the product is ready for the market. The gasoline must be purified of such ingredients as sulphur which is injurious to automobile motors. When this is done, the fluid is ready for the marketer.

a of the Ponca City, Okla., refinery of the Empire Gas & Fuel Company.

1. National petroleum News, November 9, 1927, p. 32.

We have spent the first part of this paper in a discussion of the general problems of the petroleum industry in an attempt to set forth some of the characteristics of the business, which, although they are not a part of the marketing system itself, underlie it and influence it to a considerable extent.

CHAPTER 4. TRANSPORTATION

According to the usual definitions of marketing, the first step in the distribution process is moving the finished product from the place where it is made to a place where the final consumer can get it. The petroleum industry uses four principal methods for transporting its products. These are 1, the pipe line; 2, the tank steamer; 3, the railroad tank car; and 4, the automobile tank wagon.

The first of these systems - the pipe line - is used almost exclusively for crude petroleum. It is a system with far-reaching effects, which works ceaselessly, quietly, and unobserved. If the pipe lines were suddenly removed, it would be impossible for the railroads to meet the resulting demand for transportation of crude oil. At the present time, there are about 90,000 miles of petroleum pipe line in the United States.[1]

In general, there are two main types of pipe lines, the gathering lines and the trunk lines. The gathering lines run short distances from the different oil wells to a centrally located storage plant in the district. From this point, the crude is transported through the trunk lines to refineries. Trunk systems carry the crude oil from Oklahoma to Chicago and New York, and from Wyoming to Chicago.[2]

1. Federal Trade Commission Report, Newspaper release, Dec. 12, 1927, p.8. 2. "What Makes the Old Bus Go". Q.55

The trunk lines are made of pipe usually six to eight inches in diameter, although ten to twelve inch pipe has been used. Pumping stations are placed along the route of a pipe line from fifteen to forty miles apart, according to the viscosity of the crude. If the oil is especially heavy, it is sometimes necessary to have heating equipment at the pumping stations as well. Eight inch pipe lines, working at ordinary pressure will deliver from 20,000 to 30,000 barrels of crude oil daily.[1]

The contrast between this system of transportation and the earlier method is interesting. Victor Ross, in his book entitled "The Evolution of the Oil Industry" describes the ways first used to get crude oil to the market. I quote two paragraphs from chapter eight:

> The earlier wells on Oil Creek were situated so close to the navigable waters that barrels of oil could without difficulty be loaded upon barges or smaller craft and floated down the river. In periods of drought when the water was too low to float such craft, oil boats would be assembled on a mill pond near the wells and the water dammed back while the loading was in progress. Then the gates would be opened, and the fleet, carried on the flood and guided by pilots, would be rushed down Oil Creek to the Alleghany River.
>
> As production increased, and the new districts without convenient water transportation were successfully drilled, it was necessary to devise new methods. The production of some wells, inaccessible by water, became a drug on

1. "Pacific Coast Petroleum Industry", pt. 1, pp. 156-7; Published by the Federal Trade Commission, April 1921.

[illegible]

> the market and in 1862 crude oil prices at such wells fell as low as ten cents a barrel. To meet the difficulty, a system of teaming was adopted and great caravans of oil wagons became a fimilar sight in inland oil regions. Such a caravan in the days before the pipe-lines would sometimes consist of no less than 6,000 wagons drawn by two horses each, and carrying from five to seven barrels of oil. Travellers of the early sixties encountering this spectacle were amazed at the endless stream of vehicles. Work was thus provided for a large number of men, who, with a team, could earn from $10 to $25 per day conveying petroleum from the wells to the nearest point of shipment. Roads were in many cases so bad that they tore down fences and made new thoroughfares to suit their convenience and they were a lawless set, as later events proved."

The further lawlessness of the teamsters came when an attempt was made in 1863 to build a pipe line outside of Oil City, Pennsylvania. Seeing that their earnings were threatened, they tore up pipe line three different times, and then it was finally completed only under the armed protection of the state authorities. That original two and one-half miles of pipe-line has grown to the present 90,000 miles, the importance of which has already been stressed.

But let us turn to a discussion of the methods of transporting the refined products, more especially the one in which we are particularly interested - gasoline. The evolution of the tank steamer has been almost as important to the oil industry as the growth of the pipe lines. The fleets of tankers owned by the oil companies transport both refined and crude petroleum.

The American flag flies over 44% of the tanker tonnage of the world.[1] Ocean freightage, though slower, is cheaper, and is widely used in getting California petroleum to the eastern market. Two birds have been killed with one stone in this way. The petroleum traffic has been the largest single factor in keeping the Panama Canal as a paying proposition. At the same time, the chance the tankers have had to use the canal has made cheap oil possible in eastern United States.[2]

The third method of transportation of petroleum, like the first two, has grown up entirely as

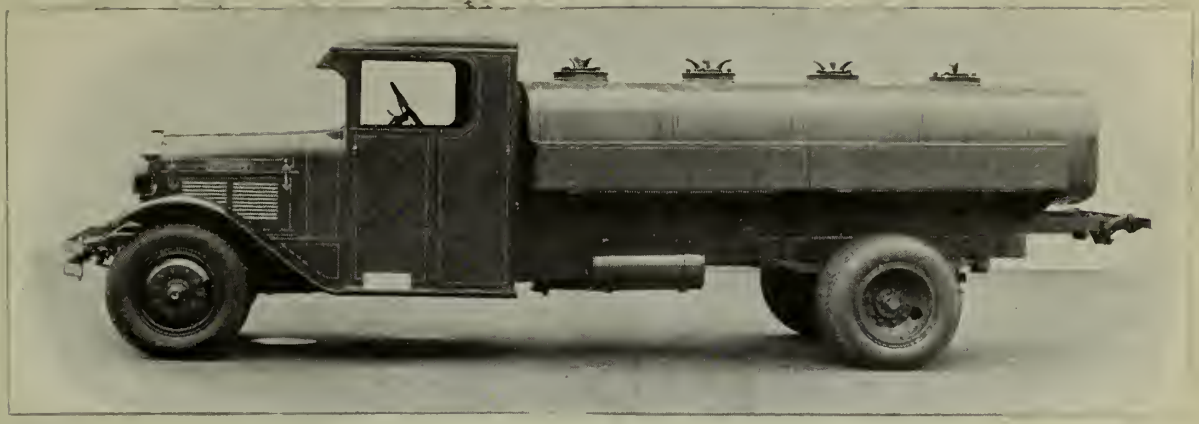
1. "What Makes the Old Bus Go". Question 55.
2. The American Petroleum Institute, in its booklet "What Makes the Old Bus Go" states that in 1924 of total canal tolls of $24,290,000, over $9,000,000 came from tankers carrying petroleum products. The oil tonnage since 1924 has fallen off, but is still being maintained at about 6,000,000 tons annually. (Question 55).

an answer to the oil transportation problem, and is used exclusively for handling of petroleum products. It is the railroad tank car. Early tank cars were built simply by attaching a large tank to a flat car, but the better method now used of building the tank as part of the car itself was soon developed. There are 150,000 tank cars in service, and oil products, even without the enormous volume of petroleum transported by pipe line and tank steamer, represent one-sixth of the freight carriage of the railroads.[1] The tank car also is used for transportation of both crude and refined oil. For that large part of the United States which is inaccessible to tank steamers, the tank car is the method used for getting gasoline from the refinery to the market. In fact, as we shall see, it is the usual unit used in selling gasoline.

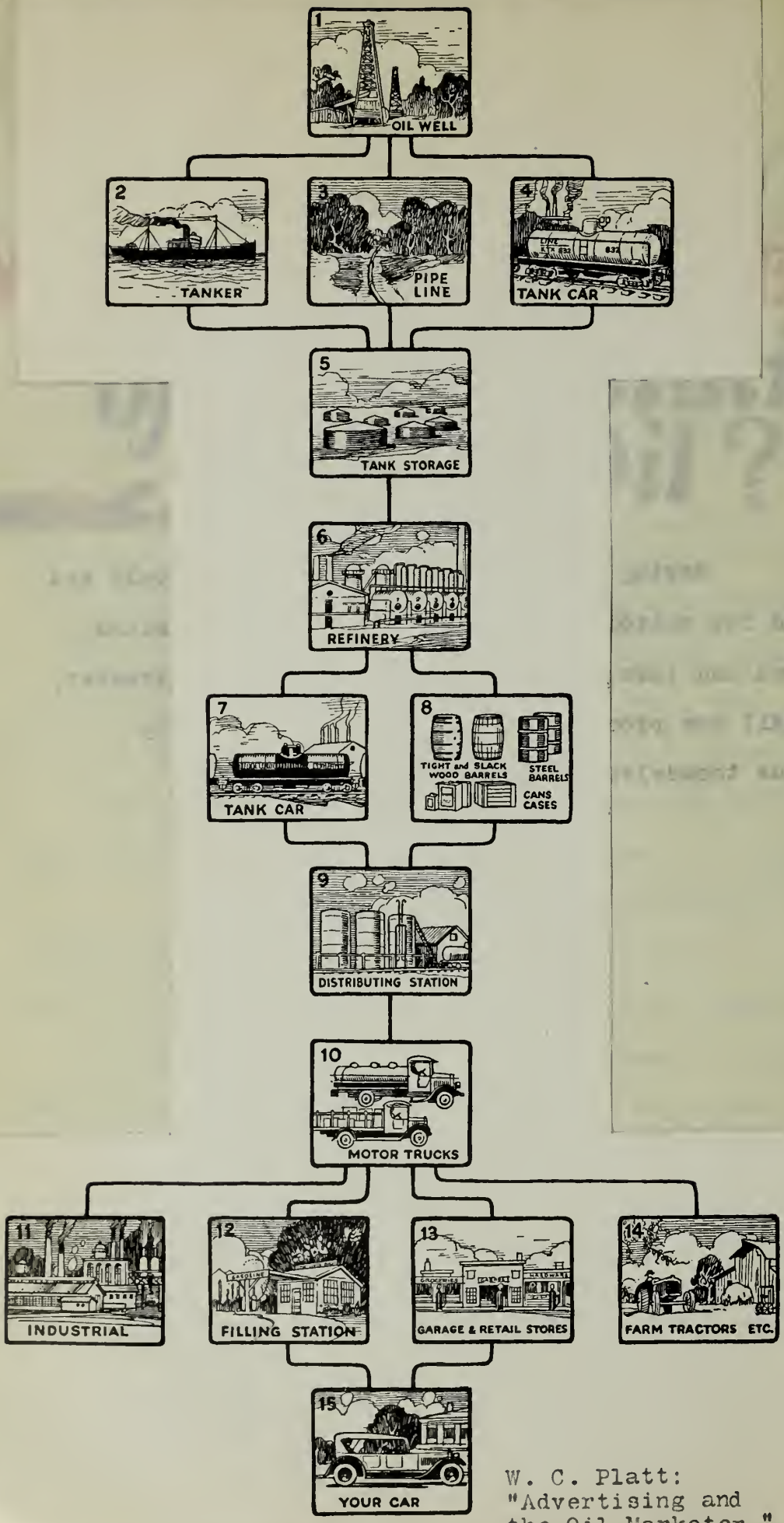
The fourth method of handling gasoline might be considered as an offspring of the tank car; it is the automobile tank truck. Carrying smaller quantities, the tank wagon differs from the pipe line, tanker, and tank car in that it is usually the property of the marketer himself. It is the link between the marketer's bulk plant, at which the tank car is emptied, and the filling station at which the final sale of gasoline

1. Dr. Frank Crane is his syndicated article "Springfield Union", September 28, 1927.

takes place.



Having inquired somewhat into the supply and demand for petroleum, having seen the product mined, refined and then brought within reach of the marketer, we shall now proceed to a study of the marketing methods themselves.



W. C. Platt:
"Advertising and
the Oil Marketer."

CHAPTER 5. EFFECT OF THE FOREGOING FEATURES ON MARKETING METHODS.

Everyone is well-acquainted with the answer the petroleum marketers have given to their problem of a large number of small unit buyers. The gasoline filling station is located everywhere, in an attempt to give the best possible service to the motoring public. This marketing system is very different from that developed in other branches of the petroleum industry. For example, orders for fuel oil, asphalt, and lubricating oil for industrial concerns, being sold in large lots to a relatively small number of buyers, can be handled through one or a few main offices, and deliveries made at the customer's plant. Kerosene for household use was sold by peddling it from house to house. It was also obtainable in grocery, hardware and general stores. At first, gasoline was sold in this same way.

But as the number of automobiles increased rapidly, a better way of handling this type of trade was necessary. Companies began to maintain one or two filling stations, supplied from the bulk plant already in the vicinity. This development has been within the last fifteen years. There were signs of such a system earlier, but the methods were very crude, and not at all like the modern service stations until within the last

dozen years or so. Gasoline was measured out in cans, and poured direct from the can through a funnel into the automobile tank. This way of doing business took considerable time and made it almost impossible to avoid spilling the gasoline. But what was more important, it was a dangerous way to handle so inflammable a fluid. The way out of this was found in the use of measuring pumps with metallic hose. A carefully built pump with a measured piston stroke was made to deliver accurate quantities of gasoline from an underground storage tank to an automobile tank. By this one method, the dangers of open storage above ground, of handling, and of pouring were all avoided.

The filling station system as we now know it was probably given its biggest impetus by the Standard Oil Company of California. This company refers to its pioneering in the field as follows:[1]

> "The service station is a relatively new thing in the world of trade, and it was originated on the Pacific Coast. This company is proud of its part in developing the service station. It was first to install a complete system of these stations. In 1914 we had 34 stations and these were the only stations on the Pacific Coast, and there was none in the East. Today we have a system of nearly 700 stations."

In the same pamphlet it goes on further to justify the service station system:

1. "The Easiest Thing in the World to Buy". Standard Oil Company of California advertising leaflet.

[illegible]

> "The service station system of marketing is naturally more expensive than if the motorist had to obtain his supply of gasoline from one of our bulk storage plants, usually located on the outskirts of a town, instead of from one of several distributing points conveniently located.
> "But even so, the service station system of marketing is a tremendous public economy. Hundreds of thousands of minutes a day are saved to the motoring public by the availability of gasoline at convenient points, and the speed of delivery at these well-organized places."

The value of the filling station to both the petroleum marketer and the automobile user cannot be denied. Various charges have been made against the system. It was first claimed that the ugliness of the stations resulted in deterioration of neighboring real estate values. More lately the cry has been that extreme designs of architecture are used to make expensive stations, the upkeep of which must come out of the consumer. Another charge is over-building in the face of extreme competition. Evidence of the growing importance attached to marketing problems is evidenced by the suggestion considered at the last annual meeting of the American Petroleum Institute (December 1927) to establish a special division for study of petroleum marketing. But since we are dealing here principally with marketing structure and not marketing problems, these questions will be reserved for discussion in some later chapter.

In discussing the gasoline distributing

business, another thing which it is well to understand about it is the fact that the marketing companies are in many cases separate entities, which operate without corporate connection with the producing and refining branches. Many of the marketers, too, have no general transportation system of their own, since they operate in small areas and find no need for it. Even the companies which do operate in all branches of the industry, such as the various Standards and the larger Independents, are not self-contained, but buy and sell in both the crude and refined markets.

Many oil companies devote their entire time to marketing. The owner buys the products he desires at quoted prices f.o.b. refinery, pays the fixed railroad rate to his bulk plant, and it is from this point that his problems really begin.

Another matter that it is well to clear up now is the method of sale. Generally speaking, there are four ways by which refiners dispose of their gasoline stocks.[1] These are 1, bulk selling under long term contracts; 2, bulk selling to jobbers under individual contracts; 3, sale to filling stations; and 4, sale at company owned service stations.

The first method, that of sale by long term contract is not very common. An example of this would be any case where a refiner contracted to sell all or most of his output to one marketing company. By doing

1. Lilley: "The Oil Industry", pp. 446-449.

this, the refiner puts himself under several disadvantages. He is unable to take advantage of price changes, for the contract governs what he gets for his product by the price of the crude. In this way, his price goes down immediately with the crude price, and at the same time he is unable to take advantage of any sharp increase in demand for refined gasoline that there may be. Of course, he is protected against an advance in crude prices. Although the refiner is free to devote himself entirely to his own problems without having to develop a marketing organization, he is left without any outlet for his product in case the contract is not renewed. As for the marketer who enters such a contract, he is under obligation to dispose of the entire production of the refiner with whom he makes his bargain. Of course, as suggested above, the marketer is a free agent when the contract expires. If he has not been satisfied with the quality of the gasoline, the terms of the contract, or anything else connected with it, he is at liberty then to try to improve his condition.

The second method is bulk-selling to jobbers under individual contracts. The selling price agreed upon in this second type of contract is governed by the condition of the market at the time. This method, of course, requires that the refiner maintain a sales organization which can take advantage of favorable market conditions. But the refiner still misses the

advantage of a constant demand on the part of the final consumer for his product. In times of excessive production, refiners selling under this second method are hard put to it to get rid of their gasoline. Some of the customers operate refineries, and naturally will sell their own stocks before buying a supply from other companies. Such a situation as this results in "distress gasoline" as it is called. The refiners without a distributing organization sell their stocks of gasoline for whatever price they will bring, the sole object being to get ready cash. Under this system, the marketer is able to make any changes in the source of his gasoline supply almost as soon as there seems to be a good reason to change. Also, the marketer is able to go out and bargain among different refiners for his gasoline. In period of over-supply, such as at the present time, this is a big advantage to him.

The third method helps do away with the difficulty of "distress gasoline". By selling direct to garages, filling stations, and other retail establishments, the refiner gains the advantage of being close to the final consumer. But a large sales and marketing organization is necessary to take care of so many accounts. Bulk stations with a ready supply of gasoline and oil must be established in every town in which the refiner wishes to market. There is also danger of credit losses. A reputable retailer, however,

who can be depended upon not to sell an inferior quality of gasoline saves the refiner the expense of adopting the fourth method of disposing of his products. For the retailer who secures his gasoline in this way there are several advantages. The refiner may have a reputation for high quality products, with a name and trade-mark that have a big drawing power. Or if the retailer wishes to build up a local reputation for gasoline sold under his own brand, he is free to do so. The latter method is that pursued by marketers who buy "spot gasoline". When they need a new supply, they buy gasoline which meets their specifications, usually at the cheapest delivered price. In this way, they maintain quality without binding themselves to a contract with any one refiner.

The last system is for the refiner to enter right into the marketing business. At the beginning of this chapter, we noted difficulties involved in such a step. Only a few companies have had finances and personnel necessary to such a growth. These are the various Standard Companies and a few Independents, such as the Texas Company, the Tide Water Oil Company, the Cities Service Company, and the Gulf Refining Company. The purpose of all such vertical expansions, whether in petroleum or any other business, is to have an assured market, and to retain within one company the savings possible between each step in the process from

finding the raw material to selling the finished product.

It is important to note that despite the size which many of these companies have reached, none has yet considered nation-wide expansion as feasible. Each has limited itself to intensive work within a more or less distinct area. This is especially true of the Standard companies, who, as a result, have been accused of combination to avoid competition among themselves in defiance of the dissolution decree of 1911.

A few companies, both Standard and Independent, carry on national distribution of lubricating oils. The advertisements of the Vacuum Oil Co., the Texas Co., and the Marland Co. show this trend. But in the case of lubricating oils, distribution is affected through agents, not through company owned filling stations. Only one gasoline has ever been nationally advertised; that is Ethyl Gasoline, which likewise is marketed through agents and not by the refining company itself.

There are several reasons why oils are marketed nationally while gasoline distribution is restricted. Some of the draw-backs to the nation-wide expansion of gasoline sales by one company have already been metnioned. Another reason is that although many motorists buy oil for quality, they buy gasoline for price. It is much simpler, therefore, to build up demand for a trade-marked oil than to create demand for

a branded gasoline. Oil, too, is sold in smaller quantities and in original packages if desired. Gasoline sales from a large underground storage tank require consumer confidence in the seller, and this is best established by personal contact, (in which the small local retailer is at an advantage). Expensive advertising, no matter how frank and straight-forward, cannot compete with a flesh and blood salesman.

Such then are the general conditions affecting the marketing of gasoline, and their influence on the method of distribution. The following chapter will discuss and actual process of marketing and also the organization and equipment used by the average marketing company.

CHAPTER 6. THE JOBBER AND RETAILER

The marketing of petroleum is similar to the distribution of many other products in a general way at least. The connecting link between the manufacturer and the consumer is supplied by jobbers and retailers. Some refiners have taken over the functionsof these two operators, as pointed out in the preceding chapter, and some jobbers operate as retailers, too. But these facts do not eliminate the steps in distribution represented by the jobber and retailer, even though it may do away with these men as independent units in the marketing process. Whoever carries on their work does it in much the same way no matter what name is given to him. For that reason, we will make no distinction in this chapter between the refining company which markets its own products, and the oil jobber who buys from refiners to resell to the consumer. There are between 4000 and 5000 "oil companies" in the United States at the present time,[1] most of whom buy their petroleum products from refiners for re-sale. Despite their great number, they do a very small per cent of the total gasoline business of the country, as the following quotation from the latest Federal Trade Commission report on petroleum shows: "At the present time, (this report says), probably seventy-five

1. From the mailing list of the largest pump and tank equipment manufacturer in the country.

to eighty-five per cent of the total quantity of gasoline consumed in the United States is sold to the retailer or ultimate consumer either by the company manufacturing it or by an affiliated concern."[1]

The first thing that every jobber must have is a bulk-distributing station in every town in which he wishes to do business of any volume. These stations vary in size from one with two or three 10,000 gallon storage tanks for gasoline and kerosene and a small warehouse for housing of oils to one with storage capacity of millions of gallons of gasoline and a correspondingly large warehouse for lubricating oils. These larger stations are usually central depots for supplying the smaller centers.

Each bulk plant must be located on a railroad siding, so that the transfer of delivered products may be made with the least trouble and expense. Purchase of gasoline is made in carload lots, so that the best price on both the product and the transportation can be secured. Besides the storage tanks and warehouse, every bulk plant has its tank truck or fleet of trucks for carrying the product to the final sales agency - the filling station. These stations, of course, may be all within a few miles of the bulk plant or they may be in surrounding towns. Maintenance of the tank trucks is a big item in bulk station expense, and the cost of maintenance depends

1. Federal Trade Commission report: "Prices, Profits and Competition". Newspaper release, p. 7.

very largely on the routes the trucks have to cover. For example, tank wagons which deliver to the farm trade (which we will not discuss in this paper) and go over long routes largely composed of poor roads sell gasoline at a much greater expense per gallon than trucks which make big deliveries to city filling stations.

One must be sure to distinguish between the bulk station and the filling station. The function of the former is to maintain sufficient storage of gasoline to avoid a shortage in the entire area which it supplies. The latter stores only enough gasoline to meet current, local demands, and has sales and service for its principal purposes.

Although the filling station is now the chief means by which gasoline is sold to the motoring public, it is a recent development, as was pointed out in the preceding chapter. Garages and general stores used to sell most of the gasoline, and the former still have a share of the business. The question of the outright sale to independent agencies as against maintaining control of the gasoline already has been touched upon as it affects the refiner. This problem also perplexes the jobber. By selling to garages and privately owned filling stations, the bulk plant owner is left to develop his efficiency in that particular branch of the industry. But if he is trying to establish a consumer demand for his own branded product, he will find it advisable to

Thousands of bulk stations such as this are scattered throughout the country.

A typical country filling station where gas, grease or ginghams may be procured; also five different gasolines.

Well arranged evergreens and attractive architectural design make this station an asset to the residential district in which it is located

operate a retail as well as a wholesale division. This is what marketers of the so-called quality gasolines do, whether they are large refiners as well or simply jobbers. A chain of company-owned filling stations is established and at the same time, the product is sold through reliable garages and privately owned stations. When the refiner builds his own filling stations, it is simply an expression of the prevalent "direct from producer to consumer" idea applied to petroleum. The purpose of such a system in any industry is to control the final sale of the product and thereby to protect the company's good-will.

A study of one of the latest contracts designed to achieve this end would not be amiss at this point. The Standard Oil Company (Indiana) has recently written up a new contract for operation of its own filling stations.[1] This company is, of course, one of those which has direct interest in the petroleum industry all the way from the wells to the consumer. By this new contract, the retail dealer who operates one of the Standard of Indiana's own filling stations is made an authorized agent of the company, is required to devote his entire time to the station he controls, and must conduct his business according to the rules and regulations laid down by the company. These provisions, one can easily see, bring the dealer under very close supervision. Some of the rules

1. Reported in "Petroleum Marketer", December 25, 1927.

of operation which the Standard lays down are as follows: 1, the company's price must be charged for gasoline and oil; 2, Credit extended to any customer not on the company's approved list is at the agent's risk; 3, When a new supply of gasoline is delivered, the old supply must be paid for; 4, Auto accessories may be carried, but refreshments and general articles, although not forbidden, are not mentioned as approved. The company pays the expenses of the station, but the dealer is held responsible for losses of the product.

The station operators are paid on a sliding scale depending on volume. The minimum rate is 2½¢ per gallon for all sales under 6000 gallons per month. An additional half cent is paid for gallonage between 6000 and 10,000 per month. An extra cent per gallon is paid for monthly sales between 10,000 and 15,000 gallons. For sales over 15,000 gallons a month, a bonus of two cents is given. In order not to penalize an agent whose actual sales for a given month fall short of a bonus but whose monthly average throughout the year would earn him bonus, the following yearly schedule has been worked out by which the amounts mentioned, less anything over 2½¢ already paid, is given the station operator:

For sales over 72,000 gallons a year ..... ½¢ per gallon
For sales over 120,000 gallons a year ..... 1¢ per gallon
For sales over 180,000 gallons a year ..... 2¢ per gallon.

The man who owns a few filling stations, but does not operate a bulk plant is in a different position from a refiner's or jobber's agent. He buys his gasoline outright from the jobber, perhaps markets it under his own trade name, and assumes all expenses of station upkeep. Under the present system, the price he pays for his gasoline depends on his bargaining power and the view competing jobbers take of the desirability of his business. To the average automobilist, gasoline competition is all in the retailing end, but we shall see later how serious the competition is among the jobbers.

Before leaving the subject of retail outlets, it is well, however, to touch further upon this matter of competition. In answer to a request which I addressed to the "National Petroleum News", that oil weekly replied that they estimated that there are now 112,000 regular drive-in filling stations in existence throughout the United States.[1] This does not include curb pumps, garages, and general stores selling gasoline. The competition that has grown up in this business can be easily pictured when one places this present day estimate of 112,000 filling stations beside the figure estimated by this same paper in 1923, which was 20,838 drive-in stations in operation, with another 8000 under construction.[2] The automobile

1. Letter, December 19, 1927.
2. "Advertising and the Oil Marketer", p. 9, by W. C. Platt of the "National Petroleum News" board of Editors.

registrations at the time these earlier figures were made were 12,357,376, making a total of 430 automobiles per station when counting stations under construction as well as those in operation. Assuming 22,000,000 cars registered today, the number of automobiles per filling station has decreased in about four and one-half years from 430 to 1 to 196 to 1. And these figures do not account for all places selling gasoline!

Mr. C. B. White of the Vacuum Oil Company touched on this subject in an address before the annual convention of the American Oil Men's Association in Chicago, April 13, 1927. His figures are given in round numbers, and he does not say just how the estimate was made, but they include all sales stations for gasoline. At the time of his speech, Mr. White estimated there were 20,000,000 cars and 250,000 outlets for gasoline and oil. In other words, there were only 80 cars for each sales station. Probably somewhere between the estimate by "National Petroleum News" and that made by Mr. White lies the real ratio of gasoline outlets to automobiles. But these two figures show very well the competition that exists in gasoline marketing throughout the country. It hits the filling station operator as he tries to build up his gallonage, and it also affects the bulk station owner as he strives to satisfy retailers on price, quality and service.

The following figures show that the increased number of stations are supported entirely by the increased number of cars, not by a larger consumption of gasoline per car. When the automobile market settles down, the gasoline distributing system will be obliged to adjust itself to stable rather than growing conditions.

Average gallons of gasoline consumed per car:[1]

1917	497.28	1923	428.82
1918	508.62	1924	424.62
1919	451.08	1925	451.50
1920	455.28	1926	472.92
1921	412.02	1927	496.44

We will touch on this subject of competition again, but for the time being let us return to our discussion of jobber and retailer.

The next few paragraphs will deal with the subject of equipment through which the jobber and retailer sells his gasoline and oil. Many marketers have standardized in one style of building and equipment with an individual color scheme which helps identify their filling stations. In buildings, everything from portable wood and metal structures to elaborate stucco, brick and stone "palaces" can be seen. As for pumps, there are three main kinds: all-metal, visible and hydraulic systems.

1. National Petroleum News February 1, 1928.

All metal
piston pump

Visible
pump

The all-metal piston type pump is the one most commonly used in New England and New York, but the other two types have become very popular in other parts of the country. The all-metal pump is just as accurate as the other two systems, but due to the fact that nothing shows the flow of gasoline, and that the efficiency of such a pump is not generally understood, many marketers have felt that it taxed the confidence of the public in the oil industry. Moreover, the maximum capacity of a piston type pump is five gallons, requiring a break with loss of time and perhaps of a larger sale, in filling the ordinary car tank.

For these reasons, many marketers have adopted the visible pump, which does not measure the sale according to the length of the piston stroke, but which instead has a glass cylinder on top into which gasoline is pumped. Markers inside the glass bowl show the customer how much he is getting, for he can watch the gasoline flow out of the cylinder. This system, of course, involves two operations, one of filling the bowl and the other of draining off, but because the bowl is often filled before the customer arrives, and also because it has a ten gallon capacity, the visible pump breaks even in the matter of speed.

The great advantage of the hydraulic meter system is continuous flow which means speed, a very popular thing now-a-days. When the hose nozzle is

Meter System

opened, flow starts immediately, due to pressure in the storage tank, and continues without any pumping for as many gallons as the customer desires. Measurement is made only by a flow-meter in view of the operator and the purchaser. The great danger in this system is leaks in the hose or connections, which mean that the entire system must be shut off until repairs are made. Otherwise, the whole supply of gasoline might be forced out of the leak in the same way that it is forced out of the opened nozzle. Gasoline coming above ground in this way would present a serious fire menace. The pressure system, like the all-metal pump, also fails to show the actual flow of gasoline.

The measurement of gasoline pumps of all kinds is very carefully watched by local sealers of weights and measures. The Bureau of Standards, of the federal Department of Commerce, has suggested specifications for testing liquid-measuring devices, and these are followed very largely by the state and local sealers. Each year, the National Conference on Weights and Measures discusses these specifications and suggests changes. Neither the Conference nor the Bureau have authority to enforce their recommendations, however. Nevertheless, such fundamental matters as the tolerances allowed in measuring devices are followed and are worth mentioning here. They are

given below:[1]

Delivery	Tolerance Cubic Inches
½ gal. or less	2.0
1 gal.	3.0
2 gals.	4.0
3 gals.	5.0
4 gals.	6.0
5 gals.	7.0
6 gals.	8.0
7 gals.	9.0
8 gals.	10.0
9 gals.	11.0
10 gals.	12.0

For deliveries over ten gallons add one cubic inch per indicated gallon.

By pointing out that there are 231 cubic inches in a gallon , and that the above tolerances are cut in half in testing new equipment, one can realize how strict they are.

The gasoline storage tank is a feature of gasoline selling which is underground and unseen, but which is very important nevertheless. Galvanized steel tanks are the only kind that should be used in the storage of gasoline, since black iron tanks are sure to rust. When the rust gets into the pump, it scratches and spoils the valves, and also damages the automobile in which gasoline containing it is used.

1. Specifications and Tolerances for Liquid-Measuring Devices, June 1927, p. 12.

For oil, the marketer has two methods of supplying his customers, in addition to carrying the branded oils in original packages. The several grades of oil which a filling station carries may be stored each in its own one or two barrel container. A measuring pump will deliver one quart, which, for double protection of the purchaser, is poured into the car from a quart measuring can. The other method is to use the barrels for storage only, and keep oil for sale in quart bottles where it may be seen by the customer.

Still another feature of all filling station equipment is an air compressor for supplying pressure for automatic pumps or the pressure system. The compressor also is the source of "free air" for the motorist. Of course, "free water" is another requisite of the well-equipped station. In another one of its interesting leaflets, the Standard Oil Company of California estimates that air service is given nearly 7,000,000 times per year at its stations. This leaflet also states that the Standard station operators dispense about 3,000,000 gallons of water per year.[1] These make added expenses that filling station owners cannot overlook.

Equipment other than that already described is optional. Greasing pits, car laundries, repair shops and accessory stores are all features which lead to the "super-service station". This tendency will be described later.

1. "What Kind of Air Do You Use in Your Tires", No. 7 of a series published by Standard of California.

One feature of the petroleum marketing system which is a clear abuse is the method of leasing filling station equipment. The filling station business is one of the easiest in the country to enter. Almost all one has to do is suggest to a large oil company a desire to run a station, and unless it is an exceptional company, it will make the investment necessary on very low terms for the lessee. Payment at the rate of one cent per gallon per pump is not unusual. Such a practice is now being criticized by leading marketers, but there seems to be no relief as long as excessive competition continues. Mr. B. H. Anglin, in an address on this subject before the American Petroleum Institute, December 1927, suggested five points that every oil marketer should keep in mind when planning to lease equipment.[1] These points are as follows: 1, the original cost and maintenance falls entirely on the lessor; 2, the "giving away" habit is easily extended to include even accessories, such as air compressors, drive-ways, etc.; 3, unnecessary and wasteful investment through duplicating installations, causing sharp competition; 4, encouragement of undesirables to enter the business; 5, the whole bill for wastefulness is finally put up to the public for payment.

1. Report of Eighth Annual Meeting, A.P.I., December 5-8-1927 p. 210-12.

The Journal of the Biological Engineering Society is a cooperative of the Society of Applied Electronic Engineers. The Society offers membership to any one engaged in the science of bio-electronics. Membership is open to any person, and subject to the approval of the Board of Directors. Members receive a subscription to the Journal, and may attend all meetings of the Society. Members of the Society may be elected to the Board of Directors. Meetings of the Board are held on the first Monday of each month. Special meetings may be called by the President, or by any three members of the Board. Members may submit papers for publication in the Journal. Papers must be approved by the Publications Committee before publication. Members may also submit papers for presentation at meetings of the Society. Such papers must be approved by the Program Committee before presentation.

1. Journal of Applied Biomedical Engineering, Volume 1, No. 2, 1970.

Brief mention has already been made of the way in which the jobber handles lubricating oil at his bulk plant and the means he supplies for selling it at his own filling stations. We have also seen how national advertising is used with some oils and not with gasoline. This brings every jobber face to face with the question of whether he will handle some widely known branded oil, or try to build up a demand for a quality oil which he himself will market locally. Except at his own stations, his brand is sure to come into direct competition with nationally advertised oils. Many independent operators carry two or three such brands for the satisfaction of transient trade if for no other reason. But this same operator would never think of carrying two or three different kinds of gasoline. So the jobber who ventures to establish his own brand of oil is up against even stiffer competition than in the gasoline end of the business.

CHAPTER 7. COST OF MARKETING

Having described the marketing methods themselves, it now remains to inquire into the problems that the oil marketer meets in the course of his daily activity. So far as possible, we have purposely omitted up to this point all such discussion in an attempt not to befog the main features of the petroleum marketing system. But the path of the oil marketer is not as rosy even as the foregoing chapters would seem to indicate. One of his biggest problems is that of cost. How much does it cost to put a gallon of gasoline in a customer's car? We have just described the long process necessary in the marketing of gasoline for the automobile trade. Such a long process must mean an involved cost, and that is just what we find. The extent of the organization required by a single company to make the final sale of refined gasoline possible is very well brought out by the Standard Oil Company of California in a bulletin, part of which reads as follows, and is copied here by way of summary:[1]

> "The beginning is in the oil fields of California whence comes the crude petroleum from which gasoline is extracted. Thence, by pipe line - we have 858 miles of underground piping in California, through deserts, 'neath rivers, o'er mountains - the crude goes to the great refineries where more than 400 products are manufactured with skill.

1. "'Yes' is all you need to Say"; Bulletin by the Standard Oil Company of California.

Chapter I. [illegible]

[illegible]

"Then the great task of distribution.
"We market our products in California, Washington, Oregon, Nevada, Arizona, Alaska and the Hawaiian Islands.
"1,500 leased railway tank-cars take petroleum products to our field stations.
"We have our own field distributors storage plants in 675 cities and towns.
"38 Standard Oil vessels - huge tankers, river boats, barges, tugs, launches - are engaged in the distribution of our products.
"1,434 motor trucks carry products to more than 650 Standard Oil Service Stations, and to over 10,000 dealers. 2,000 Service Station salesmen are at your service."

The American Petroleum Industry has listed seven costs that go into the price of gasoline. They are as follows:[1] 1, cost of the crude oil; 2, transportation and storage; 3, refining; 4, freight on distribution; 5, wholesale bulk station and tank wagon distribution; 6, profit to refiner and retail distributor; 7, state gasoline taxes and inspection fees. The last four of these items (with the exception of the first part of the sixth) can properly be called marketing costs. This chapter will discuss each of them in turn.

But before breaking up the marketing cost into its several parts, let us first try to get a general idea of the entire cost of marketing. To emphasize the high degree of efficiency maintained by the large oil companies, Mr. James A. Donan of the Standard Oil Company of New Jersey wrote to me in a letter dated December 8, 1927 that "during the time (1911) that the dissolution suit was being fought in

1. What Makes The Old Bus Go." Amer. Pet. Inst. Question 24.

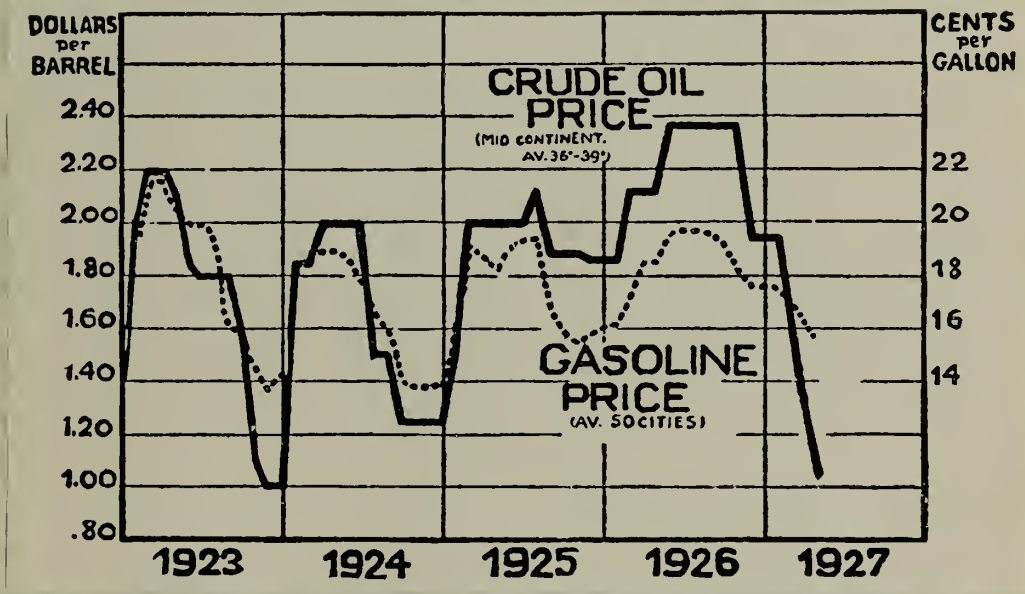
the courts it was stated authoritatively that the Standard Oil Company could sell in New York City the highest grade of refined products at a price lower than anyone then could afford to sell Lake Erie water, barreled on the lake shore."

Although this is a seemingly startling statement to make, it is easily explained by the fact that the cost of raw material represents a very small fraction of the cost of the finished product. Regarding this point, the following statement was made by Mr. Judson C. Welliver of the American Petroleum Institute in an address delivered before the Michigan Independent Oil Men's Association on July 14, 1927:[1] "It was recently calculated, (says Mr. Welliver), on the highest statistical authority in the industry that if crude petroleum in the Mid-Continent cost nothing at all, it would be impossible to sell gasoline in Washington, D. C. for less than 14¢ per gallon." Regarding the price of crude, however, Mr. Welliver stated in the same address that "the proportion of petroleum that is turned into gasoline costs rather less than one-fourth the price of gasoline at the filling station." This means, of course, that the refining and marketing functions represent by far the largest items in the final cost of gasoline. Yet, critics of the petroleum industry often point to fluctuations in the

1. Reported in "National Petroleum News", July 20, 1927.

price of crude, and then ask why gasoline prices do not go down 50% every time crude prices take such a drop.

We present here a graph taken from the "Texaco Star" for June 1927. It compares the average prices for Mid-Continent crude from January 1923 to April 1927, with averages of the tank wagon gasoline prices in fifty cities during the same period. The fact that the gasoline prices fluctuate as closely as they do with the crude prices is the surprising feature of this chart. It is thus made especially clear why a study of the marketing costs is important.



The sad part of the story about costs is the admission by many in the industry that they do not know their costs. During the spring of 1927, the "Petroleum Age" conducted an investigation into the cost of marketing, and found few operators "who had anything

approaching accurate cost figures".[1] In its issue of December 1, 1927, this same paper relates the experience of Mr. W. A. Milne, Secretary of the Ohio Petroleum Marketers Association, at a meeting of fourteen oil jobbers in an average Ohio city. Mr. Milne passed slips of paper to these men, asking for their private, unsigned opinion regarding what a gallon of gasoline had cost them by the time it had been pumped into a customer's car. From these fourteen men, each doing business in the same territory and under apparently the same conditions, came twelve different answers ranging from a cost of 13½¢ to 18¢ per gallon!

Still, one must know his costs to figure his profits. But articles in the trade journals on the subject of cost are practically unanimous in saying that many stations sell gasoline at a loss without the owner knowing it. The oil, grease and accessory business is credited with saving many gasoline marketers from regular deficits.

At this point, I wish to use cost figures discussed by Mr. C. B. Fehr of the Cities Service Wholesale Department in talks before seventeen groups of Ohio petroleum marketers during the early part of 1927.[2] These figures are those derived from the operation of one of Cities Service good bulk plants in Ohio. This particular bulk plant serves two company owned filling stations and

1. "Petroleum Age", April 1, 1927.
2. Reported in the "National Petroleum News", May 25, 1927.

thirty-one dealer pumps. Two final figures are derived, the cost of operating the bulk plant and the cost of operating the filling stations. The items are complete and give a very good idea of what the petroleum marketer must figure on in trying to estimate costs. In this particular case, the cost of operating the bulk plant was $22,976.50. Since 1,383,892 gallons of gasoline were sold through the bulk plant, the cost of sales was 1.66¢ per gallon. The cost of operating the two company-owned filling stations was $16,455. The total sales for these stations were 425,327 gallons, making a retail sales cost of 3.87¢ per gallon.

To get the total cost of gasoline marketed through this particular plant, Mr. Fehr took as an average price for group 3 gasoline 6.5¢ per gallon. This includes the cost of crude oil, its transportation to the refinery, and also the refining cost itself. To 6.5¢ is added freight to Ohio on this type of gasoline, which means a charge of 3.7¢ per gallon. The bulk plant cost of 1.66¢ and the Ohio state tax of 2¢ at that time are also added, giving a total tank wagon cost of 13.86¢ per gallon. By adding 3.87¢, the service station cost, the total delivery cost of 17.73¢ per gallon is reached. The price to the consumer must, of course, be sufficiently above this to give the marketer a profit.

Of this total cost of 17.73¢ per gallon, the marketing cost, exclusive of the state tax, was 9.23¢ per

Gasoline Marketing Costs from the Delivered Railroad Tank car to the Customer's Automobile.[1]

I. Capital Investment.	
A. Main or Bulk Plant ($36,000 @ 6%)	
1. Ground including driveways and sidings	
2. Buildings	
3. Storage Tanks	
4. Equipment - unloading, power, light heat ...	$2160.00
5. Distributing Equipment ($12,000 @ 6%)	720.00
6. Loaned Equipment ($6975 @ 6%)	418.50
II. Operating Expenses.	
A. Main plant	
1. Truck operating expenses	
a. Gas and oil	804.00
b. Tires	557.00
2. Depreciation and Maintenance	
a. Ground including driveways and sidings	
b. Buildings	
c. Storage tanks	
d. Unloading equipment.....	1080.00
e. Distributing equipment, texas, insurance ..	5270.00
f. Loaned equipment	1395.00
g. Power, light, heat, telephone, etc.	324.00
3. Salaries; Owners', truck-drivers' (3), and clerical help (1) proportioned between main plant and filling stations	7050.00
4. Sales expense:	
a. Advertising	220.00
b. Getting and holding business	360.00
5. Allowances and Bad Debts	1373.00
6. Evaporation and temperature change losses	745.00
7. Taxes and insurance	500.00
Total cost of handling 1,383,892 gallons	$22976.50

I. Capital Investment	
A. Two filling stations	
1. Ground ($20,000)	$1200.00
2. Buildings ($10,000)	600.00
3. Equipment cost and installation ($4000)	240.00
II. Operating Expenses	
B. Two filling stations	
1. Depreciation and maintenance on ground, buildings, drives, equipments, installation	2475.00
2. Salaries and percentages, service station salesmen and main plant proportional	9550.00
3. Power, light, heat, misc.	1730.00
4. Allowance for bad debts	65.00
5. Losses due to evaporation, spillage, etc.	95.00
6. Taxes and Insurance	500.00
	$16455.00
Total cost of handling 425,327 gallons	

COST PER GALLON FOR BULK PLANT OPERATION	$0.0166
COST PER GALLON FOR FILLING STATION OPERATION	.0387

1. Reported in "National Petroleum News", May 25, 1927.

gallon. This was made up of the following items:

Transportation	3.7¢
Bulk plant cost	1.66¢
Filling station cost	3.87¢
Total	9.23¢

As gasoline marketing costs go, this is not a high proportion, but before one gets too optimistic over it, it is necessary to point out several places where the cost was lower than that which would ordinarily be met. In the first place, there is the matter of depreciation charges. Only 3% of the bulk plant valuation of $36,000 is charged against depreciation. The explanation Mr. Fehr gives of this low rate is the fact that the plant was new and also was made of brick. These two features meant small maintenance and painting costs, and charges were made accordingly. The truck depreciation is set down as only 20%, instead of the more usual 25%. The reasons given for this are that the company-owned filling stations, which together handled more than 30% of the bulk plant gallonage, were each only half a mile from the bulk plant. Also, the trucks did not cater to the farm trade, and of the 31 dealer pumps supplied, all hauls were over good roads within a maximum distance of 20 miles. The fact that the gasoline, oil and tires are charged at cost means another big saving. Mr. Fehr also admitted that advertising cost is very low, due to the fact that no proportionate charge is made for the Cities Service national advertising program.

relief. Here are some of the following items:

Transportation	$ 1,[illegible]
Daily living need	1,000
Utility station item	[illegible]
Total	[illegible]

It seems advisable therefore to examine other cost figures before leaving this subject. A second exhibit is taken from the "Petroleum Age", issue of April 1, 1927. This cost sheet, which analyzes the individual expense items more carefully than the preceding account does, shows a much greater expense of maintaining a filling station. Average monthly expenses of $662.97 with average sales of 10,000 gallons brought the sales cost to 6.6¢ per gallon, or more than 70% greater than the cost at the first two stations mentioned.

This brings us to one feature of the cost problem on which too much emphasis cannot be laid, namely - GALLONAGE. This second station, with a gallonage equal to that maintained by the two stations first discussed would have had a cost figure of 3.75¢ per gallon, or slightly less than the 3.87¢ per gallon cost at the Cities Service stations. Of course, such an increase in gallonage would probably mean a much greater increase in expense, but it would have been at a much smaller ratio than 6.6¢ per gallon. It is clear from these few figures that increased gallonage will go a long way toward eliminating the high cost of gasoline marketing.

It is a very simple thing to speak glibly of "increased gallonage", but it is another matter to bring about an increase. Lowered prices will undoubtedly build up sales, but there is always a question of whether the additional gallonage under these circumstances is worth

Operator's Cost Sheet[1]

ANNUAL		MONTHLY		LOSSES	
Depreciation	$580	Light	$35.00	Litho Cans dumped	$2.00
Rent	2100	Heat	3.00	Short T.W.Comp.	10.00
Taxes	80	Telephone	2.00	Credit Losses	25.00
Wages	3360	Laundry	8.50		
Advertising	300	Tools	5.00	Yearly Losses	$37.00
License	100	Repairs	1.00		
Insurance	24	Oil Measures	3.00		
Gravel	40	Toilet paper	.35		
Painting	125	Towels	1.50		
Water	20	Light bulbs	3.00		
Trade Jours.	5	Air Gauges	1.00		
Assoc. Memb.	25	Rags	2.50		
Int. on Inv.	35	Printing	12.00		
		Brooms, Mops	.90		
Yearly Total	$6794	Shovels, Rakes	.60		
		Water buckets	1.50		
		Hand soap	.80		
		Cleaning Mat.	.40		
		Hose, Stepladder	.60		
		Pump Hose	1.50		
		Repairs (Pump)	4.00		
		Money Changers	.20		
		Distilled Water	.75		
		Mat.Stat.Use	1.50		
		Uniform caps	.35		
		Coveralls	2.00		
		Loan cans	.78		
		Total	$93.73		

Monthly average of annual expenses	$566.16
Monthly average of annual losses	3.08
Monthly expenses	93.73
Average monthly expenses	$662.97
Average monthly gallonage	10,000
Sales Cost per Gallon	6.6¢

1. Reported in "Petroleum Age", April 1, 1927

the effort. Take the case cited. If this station succeeded in lowering its costs from 6.6¢ per gallon to 3.75¢, there would be no advantage gained if in order to do this prices had been lowered so that the margin was decreased 2.75 cents.

Another method of increasing sales which also may act as a boomerang is the building of a large number of filling stations, in order to catch every bit of gallonage possible. But every oil company has done this very thing, creating extreme competition in the marketing of gasoline. As long as the demand for gasoline keeps on increasing, such a situation does not appear to be as serious as it actually is, however. Building additional stations does increase total sales, there is no question of that. But there must come a point where the price is not worth the increase. Each station, with its investment in land, buildings and equipment represents a large fixed cost which is there regardless of whether or not a gallon of gasoline is ever pumped out of the tanks. In order to justify such an expense, there must be sufficient gallonage not only to pay for that particular station, but also to prevent the costs for all the company sales from increasing. Otherwise the object of the station to increase profits by increasing gallonage is lost in excessive costs.

A very satisfactory way to strenghten the policy of economy is to compare the proposed expense, whether it be for replacing used water-buckets or for building a new

station, with its equivalent in gross profits per gallon. Consider for a moment the matter of coveralls for station salesmen.[1] Each man, let us say, has two coveralls, costing $6 each and lasting about six months. In other words, $24 is spent just for coveralls for one man for a year. The owner requires changing the uniform twice a week, meaning a weekly laundry charge of $2 per man. This brings the cost for coveralls for each man to $128 per year! Figuring a gross profit of five cents per gallon, it is seen that the sale of 2560 gallons is necessary to meet the cost of this one small item.

However, if a marketer has an accurate knowledge of his costs, it is an easy thing for him to determine the gallonage necessary to meet expenses of his particular business. Then the bending of every effort to sell that amount of gasoline would do away with the large number of operators who can't seem to understand why they don't make a profit. But as pointed out at the start of this chapter, it is the rare marketer who knows his costs.

Another element of cost which deserves especial attention is the prevalent gasoline tax. This tax is a recent development and seems to fulfill the facetious definition of a good tax as being one which extracts feathers from the goose with the least squawk. Some states seem to be carrying the idea too far, and a change in sentiment towards the gasoline tax is not unexpected. By and large, however, it is that rare species which might be called a "popular" tax.

1. This example discussed in "Petroleum Age", April 1, 1927.

Oregon was the first state to impose a gasoline tax. This was in 1919. Since then the idea has spread rapidly as is shown in the accompanying table. At the present time, only two States (Massachusetts and New York)* have no gasoline tax, twelve states and the District of Columbia have a two cent rate; fourteen states have a three cent rate; one state a three and one-half cent rate; twelve charge four cents a gallon; one state, (Virginia) charges four and one-half cents; and the remaining five states (Arkansas, Florida, Kentucky, New Mexico and South Carolina) charge five cents a gallon. This means that the average tax per state is over three cents per gallon, or figuring fifteen cents as the tank wagon price, the marketer pays a 20% additional charge as a result of these laws.

The expense that these taxes are on the automobile users is enormous. In 1926, the taxes amounted to $187,603,231.[1] During the first six months of 1927, the total collected was $101,250,841.[2] I said above that the expense of these taxes rested on the automobile users, for although the money is actually collected from the marketers, the burden is passed on to the final consumer. Some investigations have been made to determine the effect of the tax on gasoline consumption. Nothing definite has been discovered. It is interesting to note, however, that the only two states which show decreased

1. "Facts and Figures of the Automobile Industry", p. 29.
2. Reported in "Petroleum Age", November 15, 1927.
*. Illinois now has no tax, also

Growth in State Gasoline Sales Taxes[1]

	1921	1923	1925	1927	
Alabama	0	2	2	4	
Arizona	1	3	3	4	
Arkansas	1	3	4	5	
California	0	2	2	3	
Colorado	1	2	2	3	
Connecticut	1	1	2	2	
Delaware	0	1	2	3	
Dist. of Columbia	0	0	2	2	
Florida	1	3	4	5	
Georgia	1	3	3½	4	
Idaho	0	2	3	4	
Illinois	0	0	0	2	-(Nullified by State
Indiana	0	2	3	3	Supreme Court
Iowa	0	0	2	3	Feb. 24, 1928)
Kansas	0	0	2	2	
Kentucky	1	1	3	5	
Louisiana	0	1	2	2	
Maine	0	1	3	4	
Maryland	0	1	2	4	
Massachusetts	0	0	0	0	
Michigan	0	0	2	3	
Minnesota	0	0	2	2	
Mississippi	0	1	3	4	
Missouri	0	0	2	2	
Montana	1	2	2	3	
Nebraska	0	0	2	2	
Nevada	0	2	4	4	
New Hampshire	0	1	2	3	-(Increased to 4¢
New Jersey	0	0	0	2	January 1928)
New Mexico	1	1	3	5	
New York	0	0	0	0	
North Carolina	1	3	4	4	
North Dakota	¼	1	1	2	
Ohio	0	0	2	3	
Oklahoma	0	1	3	3	
Oregon	2	3	3	3	
Pennsylvania	1	2	2	3	
Rhode Island	0	0	1	2	
South Carolina	0	3	5	5	
South Dakota	0	2	3	4	
Tennessee	0	2	3	3	
Texas	0	1	1	3	
Utah	0	2½	3½	3½	
Vermont	0	1	2	3	
Virginia	0	3	3	4½	
Washington	1	1	2	2	
West Virginia	0	2	3½	4	
Wisconsin	0	0	2	2	
Wyoming	1	1	2½	3	

1. First three columns from the "Petroleum Marketer", October 25, 1927; last column from "National Petroleum News" December 14, 1927.

Schools in State Operating Night Classes[1]

	1929	1931	1933	1935
Alabama	0	2	3	4
Arizona	1	2	3	3
Arkansas	1	1	1	1
California	11	5	5	5
Colorado				1
Connecticut	1	1	2	2
Delaware	0	1	1	1
Dist. of Columbia	0	0	1	1
Florida	1	2	4	4
Georgia	1	2	3	3
Idaho	0	0	1	1
Illinois	0	0	1	1
Indiana	0	0	1	1
Iowa	0	0	1	1
Kansas	1	1	1	1
Kentucky	1	1	1	1
Louisiana	0	1	1	1
Maine	1	1	1	1
Maryland	0	1	1	1
Massachusetts	0	1	1	1
Michigan	1	1	1	1
Minnesota	1	1	1	1
Mississippi	0	1	1	1
Missouri	1	1	1	1
Montana	1	1	1	1
Nebraska	0	1	1	1
New Hampshire	1	1	1	1
New Jersey	2	2	2	2
New Mexico	1	1	1	1
New York	2	2	2	2
North Carolina	1	2	2	2
North Dakota	1	1	1	1
Ohio	0	1	1	1
Oklahoma	0	1	1	1
Oregon	1	1	1	1
Pennsylvania	1	1	1	1
Rhode Island	1	1	1	1
South Carolina	1	1	1	1
South Dakota	1	1	1	1
Tennessee	1	1	1	1
Texas	1	1	1	1
Utah	0	1	1	1
Vermont	0	1	1	1
Virginia	1	1	1	1
Washington	1	1	1	1
West Virginia	1	1	1	1
Wisconsin	1	1	1	1
Wyoming	1	1	1	1

1. Data from Census Bulletin "Continuation Education", September 20, 1937, page 4, and Census Bulletin "Vocational Education", December 10, 1937.

gallonage in 1927 over 1926 are Arkansas and Florida, both 5¢ tax states.[1]

The gasoline sales tax is not the only one which automobile owners must pay. There are four other classes of levies as well. As they have nothing to do with oil marketing directly, I will not discuss them, but they are worth noting here. The figures for 1926 are as follows:[2]

Federal Tax	$ 96,386,767
License Taxes and Registration Fees	288,282,352
Personal Property Tax	125,000,000
Municipal Taxes	15,000,000
Gasoline Sales Tax	187,603,231
	$712,272,350

By way of summary of the discussion of cost, it will be seen that for every point there are two fixed items and two variable items, all four of which when taken together make the total cost. The two fixed items are transportation and tax, whereas the variable items are bulk station and filling station cost. Following are some of the reasons that make the last two items variable: 1, the location and "style" of the retail outlet; 2, the outlay for equipment and maintenance; 3, the "service" given; 4, gallonage; and 5, credit. The price at the refinery is not stable, so that another variable factor enters into the cost of gasoline delivered to the customer. All these matters make it impossible to give one answer to the question raised regarding the cost of putting a gallon of gasoline in a customer's car. But we shall see later that even though costs are variable

1. National Petroleum News, February 29, 1928.
2. "Facts and Figures of the Automobile Industry", 1927, p. 29.

[illegible] in 1937 [illegible] are [illegible] and Electric, [illegible] [illegible] for Electric.[1]

The [illegible] takes him to not the only [illegible] [illegible] [illegible] [illegible]. There are [illegible] other [illegible] of Davis to [illegible]. It [illegible] [illegible] nothing to [illegible] [illegible] marketing [illegible], I will not [illegible] them, but they are [illegible] [illegible]. "Ed Flaherty for [illegible] are [illegible]."[2]

Insured [illegible]	$ [illegible]
[illegible] Tears and [illegible]	[illegible]
Personal Property [illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]

It [illegible] [illegible] of [illegible] [illegible] [illegible], it will be [illegible] [illegible] [illegible] [illegible] [illegible] and [illegible] [illegible]. [illegible] [illegible] [illegible] [illegible] [illegible]

there are certain limits under which it must be unprofitable to sell gasoline. This matter will be discussed in connection with the problem of the low-price filling station which is becoming more and more important.

CHAPTER 8. PRICES

In the subject of price, one meets the most controversial subject regarding oil marketing. The public and the marketer both argue over price changes, price differences, and just prices. The ordinary automobilist is much more upset over gasoline prices than over any of the other bigger charges connected with running his car. As Mr. Marcosson puts it, "while fuel only represents one-tenth of the cost of our automobile upkeep, it provides more agitation than all the other items combined."[1] The reason for this is that steady use of a car makes gasoline almost a daily charge, which people resent not so much because of its size as because of its regularity.

Because of this popular feeling, it has seemed well to include here a chart of the 1926 prices of several commodities based on the 1913 price index. This chart is copied from the "Texaco Star", which used figures of the United States Department of Labor in preparing it. The chart is self-explanatory, and shows actually what a small increase there has been in gasoline prices from 1913 to 1916 as compared with prices of other articles. When one considers that during this same period, gasoline consumption increased 900%, the wonder of the present low scale of prices is even more pronounced.

1. Isaac Marcosson: "The Black Golconda", p. 356.

House furnishings	226.5
Anthracite	225.5
Bituminous coal	214.5
Brick	205
Woolens and Worsteds	189
Boots and Shoes	184.3
Lumber	181.6
Building Materials	163.6
Other fuels	157.4
Silks	154.4
Meats	154.3
Cotton Goods	153
Milk, cheese, butter	152.6
Other foods	151.7
Grains	142.5
Poultry	142
Furniture	140.1
Farm products	133.7
Structural steel	132.4
Gasoline	124.8
1913 price index	100

PRICES FOR OCTOBER 1926 Texaco Star, March 1927, p.3

The price increase itself is not so often attacked, however, as the price variations. For example, we have such reports as that made by the American Automobile Association,[1] in which it states that in a nation-wide check-up by 950 motor clubs on November 22, 1927, forty-seven different prices were found for gasoline. For what the Association called "straight run" gasoline, prices ranged from 10¢ to 27¢ a gallon, and for "high test" gasoline, the prices were between 13¢ and 29¢ a gallon. The report states that nearness to source of supply seemed to have no effect on price, but we have already seen that the cost of crude oil is a very small part of the total cost of gasoline. Transportation is almost as large a part in the final cost, and due to the fact that it varies to different places, freight cost has its share in price inequalities. Other reasons might be pointed out why gasoline prices vary in different places. For example, the fact that demand is seasonal and is affected by such an uncertain factor as weather has its influence. The "service" that goes with each sale, and the convenience of the location of a filling station are two other matters deserving mention. Filling stations built in connection with bulk stations at railroad sidings can easily sell at lower prices than the ones built on a main highway with the best servicing system. Again, variation in gasoline sales taxes from nothing to five cents a gallon make for different prices throughout the country. The fact brought out in the previous chapter that many marketers do not

1. Springfield Republican-Union, December 18, 1927.

know their costs undoubtedly has its influence in making lower prices by which an operator sells at a loss or on a very slim margin without knowing it.

Although price variation in other retail prices do not justify wide differences in gasoline prices, figures in this connection are interesting as showing that gasoline prices are not alone in their variations. The comparative price figures given below are a few of those appearing in the July 20, 1927 issue of "National Petroleum News". They show how widely prices on other commodities differ throughout the country without exciting the comment that much smaller variations in gasoline prices do.

Comparative prices on the same dates:

	Sirloin steak per lb.	Potatoes per lb.	Gasoline per gal. less tax
San Francisco	30		18
Buffalo	47		19
Dallas	33.6	5.2	18
Chicago	46.4	3.2	18
Birmingham	39.6	5.3	20
Boston	69.6	3.2	20
Washington, D. C.	47.3	4.0	20
Portland, Ore.	28.4	3.1	18

Another cry raised against the petroleum industry in general and the marketers in particular is that in addition to being unstable, prices are "dictated" by a trust of the old Standard interests. Such charges are doubtless based on the fact that almost all price changes are initiated by the various Standard companies, the Independents usually accepting the change and adjusting their prices accordingly. The

does itself make commodity use its ultimate in saving
lower prices of units of commodities at a time when i
are using energy without causing it.

Although other materials in short supply
in any locality are different in quantity from electric
in this connection are interesting to examine that electric
prices are not alone in their peculiarities. The accompanying
price figures below are a few of those illustrating in
the July 1947 issue of "Business Conditions Week". They
show the wholesale prices in other commodities after discounting
the country without applying the discount that each material
varies in wholesale prices for:

	Price Change from 1939 to 1947	Price Change from 1946 to 1947	Quantity per unit Last Year
Raw Sugarbeet	20		1b
Matzato	67		47
Coffee	36.3	6.1	1b
Cotton	more	7.2	1b
Gasoline	36.6	8.1	1
Wheat	more	3.2	1
Tobacco, U. S.	97.2	6.2	1b
Petroleum, Crude	84.4	2.4	1b

Industry is asked against the previous commodity
is caused and the materials is carried on in that an auction
to cause caused, prices are "distorted" by a cause of the
Bureau Standard Laboratory. Such changes are described based on
the test year given all price changes of the Division of the
revised Standard Commodity, the Distribution Division
the change and adjusting their prices accordingly. The

Federal Trade Commission describes the way in which gasoline price changes are made as follows:[1]

> "General changes in the tank-wagon market prices of gasoline are decided upon and announced to competitors, generally a day in advance by each company of the Standard Oil group for its particular territory, independently of the other Standard companies. These changes in prices, which are not simultaneous for the different Standard companies, are generally followed immediately by most of the Independent marketers in the respective regions in which such price changes are made."

Regarding price changes, Professor E. R. Lilley of New York University writes:[2]

> "The size of the large units of the old Standard Oil Company makes them leaders in price changes, but the strength of the larger Independents and the great number of small refiners make it impossible for these concerns to make prices that are not in close relation to the actual value of the products and in conformity with supply and demand."

I do not wish to give the impression, however, that the gasoline price structure is beyond reproach. In such a new industry where many small marketers do not know their costs and where competition is so keen, the result is sure to bring stations with different methods and different prices. Since we have seen that this is exactly what happens, let us inquire into the so-called "low-price filling station."

There are in the gasoline business, just as in other businesses, two different merchandising plans. One goes on the principle that a customer will go out of his way

1. "Prices, Profits, and Competition in the Petroleum Industry;" Newspaper release of Federal Trade Commission report, Dec. 12, 1927, p. 3.
2. Lilley:"Oil Industry", P. 451.

Federal Trade Commission describes the way in which creative
effort benefits are made as follows:

"General changes in the investment patterns of resources are effected more
promptly and completely in response to changes in profit rates than in
response to changes in any other economic variable. Profits are the
strongest lure for the particular activities, industries, or
geographic areas that promise favorable returns. Losses compel
withdrawal from the activities which yield them. Thus, changes in profits, which are
closely associated with the activities of innovators,
accelerate, are generally initiated immediately
by some of the innovators' successes in the
innovative regions in which such gains
occurred are known.

[illegible] [illegible] [illegible] [illegible]

"The acts of the large units of the old
standard Oil Company group [illegible] in
price concerns, are the strength of his target
[illegible] and the great number of small
refiners make it impossible for these concerns
to make prices that are out of line [illegible]
in the mutual ratio of the economic [illegible]
[illegible] with supply and demand.

I do not wish to [illegible] [illegible]
[illegible] for possible price elasticity [illegible]. It
[illegible] a new industry there [illegible] [illegible]
[illegible] there [illegible] [illegible] [illegible]
[illegible] to [illegible] [illegible] [illegible]
[illegible]. Since [illegible] [illegible] [illegible]
[illegible], [illegible] [illegible] [illegible]
[illegible]."

[illegible] [illegible] [illegible] [illegible], [illegible] [illegible]
[illegible] [illegible], [illegible] [illegible] [illegible] [illegible]. [illegible]
[illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible]

1. "Prices, Profits, and Competition" in the Hearings
[illegible] Temporary National Economic Committee,
Part 7, Dec. 11, 1941, p. 3.
2. "Profits, Prices" p. 181.

to save a few cents. It requires operation on a strictly "cash-and-carry" basis, and gives the minimum of service. Price is intended to be its most important if not its only attraction. The other method believes in servicing a customer by building filling stations at convenient points, and maintaining tank wagons for supplying these stations from the bulk plant. Credit is granted and other services given, all of which is reflected in the price. Service and not price is the drawing power for such stations.

The first plan is usually operated in connection with a bulk plant. For this reason, it is found on the outskirts of cities at a railroad siding that is sometimes approached over a road that leaves much to be desired. The pumps are fed direct from the bulk station tanks, which are filled, as we have seen, from railroad tank cars. The station and grounds cannot be made as attractive as those connected with a filling station on a public boulevard. Naturally a low-price appeal is possible under such conditions, and stations operating in this way usually sell at about four cents under the general filling station price. Bulk plant filling stations of this type are very popular in certain sections of the Middle West, particularly in Ohio. Some of these stations take great delight in advertising their low price as an expose of extortionate prices charged by the larger companies.[1] But from our study of costs, we see that for what they give in convenience and service, the proprietors of a chain of

1. For discussion of low price filling stations, see "National Petroleum News", July 6, 1927.

regular filling stations do not charge a price that is out of line.

Between the exponents of two such marketing methods, price wars are bound to occur. When a large marketing company, operating under the second method described above lowers its price as a result of competition, that is when the low-price filling station owner really gloats. And it would seem as though he had some justification. But the demand for volume sales is so great that once competitors start undercutting each other in prices, there seems to be no end to the viscious circle that is started. Of course, the operator of a regular boulevard filling station who tries to meet the price of a bulk plant competitor is sure to find himself in trouble. The trade journals have had considerable discussion of the price-cutter. One paper, the "Petroleum Age", suggests an advertising campaign to arouse public suspicion over the quality of low-price gasoline. But it is pointed out that this would be unfair to such low price stations as sell quality gasoline at low prices.

The Larkin Company operating bulk plant filling stations in Buffalo is cited as one of this type of marketers who sell quality gasoline at a low price. Below is printed the context (though not the form) of a recent one-eighth page newspaper advertisement used by the Larkin Company:[1]

1. Buffalo Evening News, January 24, 1928.

Replace illegible sentence in first column [illegible]
end of line:

Between the sentences at the end [illegible]
personal pride were found at stake. Then a [illegible]
definite [illegible], underlying under the second [illegible]
description begins either its path as a [illegible] of [illegible]
position, that is where the [illegible] critic attains
newly regain vitality. And at first even in [illegible]
his own justification. But the second [illegible]
it by first make some [illegible] [illegible]
some where to [illegible], there begins to be not so the
[illegible] clarity that is apt[illegible]. It is [illegible], the
[illegible] of a [illegible] [illegible] [illegible]
crime to wear the prize of a [illegible] [illegible] is
able in time [illegible] to [illegible]. The [illegible] [illegible]
have [illegible] [illegible] [illegible] of the [illegible]-number
one point, the "[illegible] age", [illegible] [illegible]
[illegible] to arouse [illegible] [illegible] over the [illegible] of
[illegible] [illegible]. But it is [illegible] [illegible] [illegible]
[illegible] to [illegible] [illegible] [illegible] [illegible] [illegible]
[illegible] [illegible] [illegible] [illegible].

[illegible] [illegible] [illegible] [illegible] [illegible] [illegible]

> "Larkin Gas 10¢ a gallon to customers purchasing groceries amounting to $1.00 or more at Larkin Economy Stores. For every dollar spend at your neighborhood Larkin Economy Store this week you will receive a certificate entitling you to purchase regular High Quality Larkin Tested Gasoline at any of these three Larkin Gas Stations:..."

Just what the connection is between one dollar's worth of groceries and the right to buy gasoline at ten cents a gallon is not explained by the advertisement. It is just another one of the schemes to increase gallonage. More of these ideas will be discussed in the last chapter. The Larkin Company claim that their gasoline is high quality is probably not exaggerated, for it is a more or less well known fact that this company buys a large part of its supply from the excessive production of the Standard of New York's refineries.[1] In fact, this is supposed to be a favorite way used by many refiners to get rid of large stocks. What can be sold at their own filling stations brings a high price; another large portion is sold to dealers at tank-wagon rates; and what is left is sold, perhaps at a loss, to owners of low-price filling stations. By so doing, the marketers are only creating their own problem of cut-price competition, but the practice seems to continue nevertheless.

The reason for such a system, or rather lack of system, is summed up by the Federal Trade Commission when

1. Information given in a personal interview with the Buffalo representative of a large pump and tank equipment manufacturer.

"Derrick the Jay a jailor at overnight
investing privately according to Ji.Or
or ever at Orrin Drumup Electra. To
cargo Motor agree a you Jaybirdsees
Carrie Dominy Olsen Kiss week you will
Impolite a visibility Obligation Jim to
petroleum recover like Deputy Leech
Vectra Theodore or Jay or Texas Sorry
Judith Jim attitude..."

Just what are democratic is listened the Jailor's world of opposition and the right to our elections to have made a policy is not objected to the authorities. It is just another one of the attempts to territorial pollutants. Here it takes time will be discovered in the last chapter. The Jackie Company claims that their operation is only recently is grossly not complicated, but it is a piece of lose tell jurors last that this economy into a large part of its supply from the economic pressures of the standard of the York's relations." In fact, this is supposed to be a tentative key taken by many jailers at his all of large effects. This can be able to tell the Trinity statutes O-Jays a high actual maximum large portion is said to address it Jaybirdsees terms, all work it life is said, Motions at a large source of Democratic visiting clients. To be after, the authorities are only growing until was founded of old-style dependents, but the Jim-Jim opens to work Jaybirdsees.

Can reason for most a Jackie, or Deputy-Jays of states, is caused to by the process Texas Corporation Jay

1. Information Jailor be a Political Jaybirdsees with the Deputy representative of a large jump and Jim Jaybirdsees Jaybirdsees.

it states that "the wide spread which frequently exists between the tank car and tank wagon prices is the cause of a great deal of the so-called 'price-cutting' that occurs at times in many parts of the country."[1] Marketers are willing to cut this margin for the sake of gallonage, or sell what they can at a high price, being content to take what they can get for what is left over, almost "trusting to luck" that by so doing they will be able to make both ends meet. Just how far that margin can be cut is a question. If marketers really knew their costs, how much of the margin was needed to cover their expenses and give them a fair return, and if they figured how great an increase in sales is necessary to cover a drop of even one cent in the price, there would be fewer price wars. Such a suggestion, however, does not really solve the problem. A marketer cannot very well content himself with a knowledge that his prices are"right" when his competitor across the street is under-selling him and taking away his customers.

It is not competing retailers alone who come in for price wars. It is the jobber first of all who cuts down his tank wagon price to win a new customer. Due to the wide margin referred to by the Federal Trade Commission, the temptation is great to cut down on that in order to increase gallonage. But jobbers who do this find themselves in trouble sooner or later. Old customers learn of the new price quotation and insist on it for

1. "Prices,Profits,and Competition in the Petroleum Industry"; Newspaper release of the Federal Trade Commission report Dec. 12, 1927, p. 10.

themselves. Perhaps they even shop around among other jobbers to get an even better price. A trade journal tells of one jobber who left his business at night in satisfactory condition and found in the morning that everyone of his customers had been taken away from him by the lower price of a competing jobber.[1] It is the old story of the difficulties involved in leaving a single price system for one in which haggling and bargaining over prices predominates. Big gallonage is truly the aim of every oil marketer, but a company cannot safely play with the tank wagon price in order to get gallonage. Every gallon sold has its costs, and if bigger sales are won by cutting the price, the increase is often found not worth the sacrifice. The temptation to jobbers to give discounts is a strong one, however, with the result that tank wagon prices and margins are largely theoretical.

We see that the gasoline price structure leaves much to be desired. In the opinion of one middle western marketer, excessive profits have expanded the industry, over-expansion has brought down prices, cut prices have developed weaknesses and failures, with the result that the industry must be financially reorganized on a new price structure having closer margins.[2] Just what the outcome of the present situation will be no one can tell, but it is certain that smaller margins and better knowledge of costs will go far toward clearing up the difficulties pointed out in this chapter.

1. Reported in "National Petroleum News", Aug. 24, 1927.
2. Reported in "National Petroleum News", Oct. 15, 1927.

CHAPTER 9. OTHER MARKETING PROBLEMS

Reference has already been made to most of the subjects that will be taken up in this chapter. They all center about the question of the amount of service that should go with the purchase of a gallon of gasoline. We have already seen that opinions differ among marketers on this point, and shall carry the discussion further at this time.

a. Accessories

An analogy has been drawn between the gasoline filling station on one hand and the cigar and drug stores on the other. It is claimed that just as these last two retail establishments have branched out beyond their original fields, so the filling station is becoming much more than a place at which to get gasoline and oil. Every petroleum marketer is faced with the problem of whether or not to handle automobile accessories. The "pros and cons" of this question are well set forth in the June 29, 1927 issue of the "National Petroleum News".

Several arguments are presented in favor of selling accessories. In the first place, the sale of these extra items should bring extra income. In the face of decreasing gallonage and increasing sales cost, such additional revenue is very welcome. In the second place, by carrying accessories, the marketer gives his stations a wider appeal. Such an argument, however,

always brings up the question of whether or not a motorist goes to a filling station for gasoline and oil only, and to a regular accessory store for his other needs. A third argument in favor of carrying accessories is that one department of a business brings sales for another. A filling station, garage, accessory-store and lunch-room would each of itself stop autoists, with the result that while stopped they might patronize one or more of the other parts of the business. A fourth appeal for an accessory division is that the filling stations are open at hours when regular accessory stores are closed. To have an item which a customer finds himself in need of some evening or on a week-end or holiday wins much goodwill for the filling station able to supply the service.

But there are equally strong arguments against the sale of accessories. In the first place, it is likely to arouse the ill-will of the local accessory dealer, who, in retaliation, may set up a curb pump. This would only create another competitor in what is already a highly competitive field. In the second place, accessories are a price-cutting item, which would bring added trouble to the marketer probably not worth the extra gain. A third argument against the sale of accessories is that the additional services in the form of attaching the item where necessary, of adjustments on sale of imperfect tires, and of credit extension on big bills would be an added expense to the marketer. The fourth argument

is similar to the others in that the stress is laid on additional expense. An efficient accessory department would mean the hiring of at least one extra man to handle the goods.

From the fact that many stations carry accessories while others do not, it is easy to see that the problem is a live one. The decision is entirely up to the marketer and seems to lie between a desire to expand the service given and an equally strong desire to keep down expenses. It might be well to point out that those stations which handle accessories successfully carry a limited number of items, with very few or no varieties of each article. Nationally advertised goods are also found to be the best sellers.[1]

b. The Super-Service Station

As was done in connection with the foregoing discussion on accessories, an analogy might be used to introduce the subject of the super-service station. Mr. C. C. White, whose address before the American Oil Men's Association last spring has already been referred to,[2] ventured the statement in this same address that just as movie "nickelodeons" had been wiped out by the super moving picture house, so the small corner filling station will eventually give way to the centrally located super-service station.[2]

These stations will be equipped not only to sell

1. See "National Petroleum News", June 1, 1927.
2. Reported in "National Petroleum News", April 20, 1927.

it similar to the theory that the atoms in this do
mathematical theories. In [illegible] Schrödinger
wrote that the finding of at least one letter out of [illegible]
the [illegible]-

From the fact that many scientific theories
write themselves as art, it is easy to see that the [illegible]
a life form. The resolution is carrying up in the mathematics
and seems to [illegible] a basis to explain the physics
mixed and as [illegible] attempt basis to many time segments.
It might be well to point out that some scientific minds
handle nonsensible inconsistency very [illegible] Einstein [illegible]
theory. His very [illegible] or no variables of many criteria.
Relationship particles given was also found by [illegible] the most
matters.[2]

C. The Super-Central Station

It was done in conjunction with the [illegible]
discovering in particular, an attempt might be [illegible] to
[illegible] the analysis of the super-massive objects.
Dr. V. C. Rubin, whose actions helped the American [illegible]
Bell's Association [illegible] already [illegible] [illegible]
in,[3] removing the [illegible] in this case objects that
just be mere "blackholes" but [illegible] [illegible] on to be
super moving picture rooms, by the name [illegible] filling
station will [illegible] [illegible] the [illegible] [illegible]
super-massive [illegible].[4]

These stations will be [illegible] and [illegible] to all

3. Dan "Universe Information Issue", [illegible], [illegible].
4. Reported in "National [illegible] Times", April 20, [illegible]

gasoline and oil to a large number of customers at once, but also will be able to give crank-case and greasing service, also auto-laundry and repair service all on the same grounds. Such stations have been built, and according to reports in the trade journals, give every promise of success.[1] A system of this kind would undoubtedly do away with both the over-building and excessive competition now seen in many parts of the country in the marketing end of the gasoline business. Mr. White believes that it is the future gasoline distributing system, which will be in control of a few well-managed oil companies.

The story of the super-service station remains to be written, however, but it is a movement which every wide-awake marketer will watch.

c. Competition

Considerable reference has already been made to competition. In this connection, I wish to quote once more from Mr. White's address. He remarks how peculiar it is that "the automobile which has brought the country to the city and the city to the country and has annilhilated distance, must have a service station every few feet in the city and every mile or so in the country." He then raises the question "Are so many small units economically sound?" We have written above of Mr. White's belief concerning the outcome of this situation, namely, that when

1. "Petroleum Marketer", November 10, 1927.

getting and it is a large country to welfare's in this, but also only to make to give [illegible] and training matters. Labor mobility and wages matter at it is some problem. Some studies have been made, but according to reports in the trade journals, this area presents enormous. A system of this type would have only with both the over-building and unemployment problems in some parts of the country in the economy, and of the existing conditions. But this matters that it is the future planning distributing system, which will be in control of a bit multi-national oil companies.

The study of the multi-national oil companies is of course, important, but it is a problem which [illegible] with many.

c. Competition

Considerable interest has already been made in competition. In this connection, I also to [illegible] more time on. This'd indeed. To examine it [illegible] it is that the nationals which [illegible] the economy to the side and the only by the economy and the activities which, must have a serious effect [illegible] the fact is the only led [illegible] on in the country. It [illegible] raise the question that is [illegible] country [illegible] [illegible] [illegible]

the gasoline marketing business settles down it will be to a system of super-service stations.

There is still another side to this competition question besides the retailers' or even the jobbers', to which reference has been made in a preceding chapter. It is the wider question of monopoly as opposed to competition. It is expressed in the fear of some people that the Standard "group" or interests still control the oil industry despite the decree of dissolution. The uninformed declare that in the first place the Standard companies refuse to compete among themselves. For a number of years after the decree of dissolution this was probably true. But it was due to the desire of each unit of the old Standard to accustom itself to the new circumstances and to strengthen itself within limited but nevertheless large territories. The latest report of the Federal Trade Commission on the petroleum industry notes exceptions to the former practice of Standard companies to confine themselves to what were their own territories under the old arrangement.[1] The Standards of New York and of California compete on the Pacific Coast. In Texas and Arkansas, the Standards of New York and of New Jersey compete. Also, within the last few years, the Atlantic Refining Company has invaded the New England territory of the Standard of New York. In other than the marketing field, the recent newspaper publicity given the dispute between the Standard of

1. "Prices, Profits, and Competition"; Newspaper release of Federal Trade Commission Report, December 12, 1927; p. 3.

New Jersey, the Standard of New York and the Vacuum Oil Company proves that the dissolution decree has separated the interests of the members of the old Standard group.

Moreover, the growth of several large Independent companies has eliminated the possibility of Standard control of any branch of the oil industry. The investment in the oil industry is estimated at $11,000,000,000, of which only $3,500,000,000 is ascribed to the various Standard companies.[1]

The American Petroleum Institute gives some interesting figures regarding the prominence of the Standard Oil Companies in the petroleum industry. The following figures are for the relative refining capacities of the Standard and Independent "groups";[2]

	Standard	Independent
1904	84%	16%
1918	42	58
1920	38	62
1924	33	67
1927	31	69

Competition, for better or worse, seems to be here to stay. From what we have seen of it in the marketing end of the oil business, less competition would mean improved conditions. Mr. L. V. Nicholas, President of the Independent Oil Men's Association, stated at the recent annual meeting of the American Petroleum Institute that "The oil industry today has easily 50% more retail outlets than the volume of consumer gallonage can possibly justify, and resulting overhead is a burden on the industry as well as the public."[3]

1. Dr. Frank Crane in his syndicated article; "Springfield Union", September 28, 1927.
2. "What Makes the Old Bus Go", Amer. Pet. Inst., Introduction.
3. Reported in the "petroleum Marketer", Dec. 10, 1927.

The Library of the Standard Oil Company (New Jersey) has been
compact enough for the discussion during the early years of
the existence of the Standard Oil Company (New Jersey).

However, the growth of several large departments
necessitated the allocation for specific use of
of the entire floor of the old building. The increase in the
oil industry is reflected in [illegible] of which their
[illegible] is required by the various departments.

The American Petroleum Institute gives some
interesting figures regarding the production of the
crude oil consumed in the petroleum industry. The
following figures are for the years ending December
of the amounts and [illegible]:

	Imports	Exports
1924	26%	12%
1918	4%	7%
1920	3%	6%
1924	2%	8%
1927	3%	6%

[illegible] for years to come, seems to be open to
[illegible] to have some kind of a [illegible] and of the oil
[illegible] time [illegible] would seem important enough.
Mr. L. T. Bloomer, president of the [illegible] oil men's
Association [illegible] as the result several months of the
American Petroleum Institute that "The oil industry today
has nearly 50% more refined stocks than the volume of
consumer [illegible] for existing [illegible]. And thereby
originated is a [illegible] in the industry on that is [illegible]."

1. Dr. Ralph Arnold in the [illegible]; Petroleum
Age", September 20, 1927.
2. What Ideals the Oil [illegible]
[illegible] Amer. Inst. Mining [illegible]

d. Credit

Granting of credit by retail marketers is a dangerous thing, due to the fact that gasoline is used up soon after it is put in a customer's car. Gasoline bill collecting is in the same category with collecting on the account of the well-known dead horse. The expense of keeping even good accounts, the expense of collecting, and the danger of "dead-beats" are all against the granting of credit.

In chapter six, we saw that the Standard of Indiana warned its agents against granting credit to anyone not on the company's approved list. Other large marketing companies also have an approved credit list, and refuse to take responsibility for credit granted to customers not on this list. This safeguard is necessary against the large number of motorists that there are who are willing to get something for nothing. There are many stations where just this thing is possible. A trade journal[1] quotes one Chicago oil man as saying that "there are plenty of stations in Chicago to keep any motorists in free gasoline for a year, if he has a good line of patter and does not show up at the same place too often." This same article tells of the experience of a large Chicago marketer who found himself minus $150 worth of gasoline, all to one man. The driver

1. "National Petroleum News", May 18, 1927.

4. Credit

Granting of credit by retail merchants is a dangerous thing, due to the fact that everyone is more or less after it in our country's war. Everyone will participate in the same category with unlimited or the maximum of his well-known good income. The expenses of living even good economic, the expense of borrowing, and the danger of "bank-books" are all against the practice of credit.

In Chapter six, we saw that the disposal of Dealers receive the people wealthy credits usually to improve not on the customer' improved list. Other large materials customers also have an approved credit list, and reduce by these responsibility for credit granted to customers not on this list. This safeguard is necessary against the large number of merchants that there are who are willing to get accounts for nothing. Every man also realizes every lot help doing is business. A large [illegible] wants to [illegible] all that he can as easily that "every man pleased or displease is customer to keep any customers is true [illegible] for a time. If he like a true like or [illegible] some one else up at the same place for others." This same security help of the institution of a large [illegible] merchant who [illegible] store [illegible] of [illegible] not to [illegible].

1. "Retained Investment Income", [illegible] Corp.

had signed up for each purchase, but every time with a different name, address and telephone number. He was traced through the similarity of the hand-writing and the identity of the registration number. But unfortunately for the marketer, when found the autoist had nothing on which the company could collect its bill. Such is the situation in which the retailer who grants credit is likely to find himself.

The jobber who extends credit is somewhat better protected. At least, he is fairly sure of where to find his debtor when the bill comes due. Also, he can see for himself the assets and the methods of the company to which he gives credit. In the case of the marketer selling through his own stations and charging each operator for the gasoline delivered, the policy already noted of the Standard of Indiana is a wise one. This company, before delivering a new load of gasoline, collects the bill on the old one.

e. Advertising

Advertising in the oil marketing business shows two developments: 1, that of regular magazine, newspaper and outdoor advertising; and 2, what might be called "stunt" advertising put on at different intervals for the purpose of boosting gallonage.

Reference has already been made to the national advertising campaigns for several different lubricating oils and for Ethyl gasoline. Such campaigns are carried on through the medium of the large circulating weeklies,

such as the "Saturday Evening Post", "Literary Digest", "Colliers" and "Liberty". We are all familiar with newspaper advertising for leading gasolines sold in our own localities. Leaflets and pamphlets are used by refiners in direct mail campaigns for jobbers' business. For outdoor advertisement, the filling station itself usually is a first rate advertising medium, set off as it usually is from its surroundings.[1] Uniformity of station buildings, pumps and other equipment all make for easy recognition of a marketer's station anywhere. The display of the company's trade-mark or trade name on buildings and pumps gives each station the benefit of company good will.

One very elaborate system of road-side sign-boards has been worked out by a Baltimore oil company for advertising its special brand of gasoline.[2] A large sign pictures some animal and a few words are used to draw an analogy between a well-known quality of the animal and a quality of the gasoline. For example, an elephant symbolizes power, a polar bear is ready for cold weather, a leopard represents the gasoline as unchanging as the leopard's spots, a giraffe is head and shoulders above all others, a lion is the acknowledged leader, while with a camel one gets more miles per gallon.

In the field of "stunt" advertising, oil companies have tried several different methods of building

1. "Motor Oil Medium", Texas Co. House organ, March 1927 features this point.
2. Reported in "Petroleum Age", November 1, 1927.

gallonage. Perhaps the most startling is that used by a group of stations in Fort Worth, Texas. With each dollar's worth of gasoline purchased, the customer at any of the stations in this plan received a numbered ticket. Each month, a ticket was drawn and the lucky holder received an automobile free. The first month of the contest the car was a Chevrolet Sedan; the second month, it was a Chrysler Sedan; the third month, a Peerless Coupe; the fourth month of the contest brought forth a Peerless Sedan, while the fifth and last month which the report on this campaign covers finds the gift car another Chevrolet Sedan. The car was driven from station to station and proved a tremendous boom for gallonage, but evidently there was a limit to the attraction.[1]

Other schemes[2] that have been tried are giving away turkeys at Thanksgiving, selling premium gas for one week at the price of regular gasoline, and having a "favor day". Under this last scheme, a one pound box of chocolates was given to every fifth driver to buy gasoline at the station. These ideas are in the same category as Larkin's grocery advertisement referred to in a previous chapter. The object seems to be to increase gallonage at all costs, and the cause is undoubtedly the high degree of competition existing in oil marketing.

1. Reported in "National Petroleum News", August 24, 1927.
2. Reported in "National Petroleum News", May 25, 1927.

f. Conclusion

This study has stressed one outstanding fact concerning oil marketing:- it is a new industry, not yet settled down, but still feeling its way about and trying to find the best method of filling the demand which is the reason for its existence. The bulk station and the filling station are today's answers to the problem. Whether the wastes of excessive competition and over-building will force a modification of this system remains to be seen. Adjustments and changes are bound to appear, for the tremendous growth in the use of the automobile cannot continue at the same rate it has been gaining since the war. It is this great growth in the number of automobiles that has held off the testing of the gasoline marketing system this long, for while the demand kept increasing by leaps and bounds, the multiplication of outlets received no set-back. The next five or ten years will doubtless see this testing period, and the industry, being free by then of its "growing pains" should be much better adapted to its place in American life than it is at the present time.

6. Conclusion

This study has attempted two interwoven themes: considerable city modification--it is a new industry, more like building cities, but after locating its city about 80% of the time the most obvious method of fitting the factory into its surroundings. But this fitting and its utilize stories are today's answers to the question: whether the factory is successful and therefore the factory will have a modification of the other question to be seen. Difficulties and changes are going to arise in other the transmission grows to the use of the microcell cannot continue at the same rate it has been existing since 1945. It is this great growth in the economy of information that has held off the factory. I can possible something simple like food. For while the demand may increase in times and however, the multiplier/on of points invested is self-used. The most time in the years will increase the city housing factor, and the recovery, mainly like to take on the "already going" cannot be just matter changed in its place in American life than it is at the present time.

BIBLIOGRAPHY

Nothing has been published dealing solely with the subject of this paper, so that the information used has been gleaned from books, government bulletins, other pamphlets, and trade journal and newspaper articles. The bibliography is therefore grouped in these four classes.

BOOKS.

E. R. Lilley:"The Oil Industry", D. Van Nostrand Co., 1925

Victor Ross;"The Evolution of the Oil Industry", Doubleday Page & Company, 1920.

"American Petroleum Supply and Demand", Report to the American Petroleum Institute, McGraw Hill, 1925.

These books, although dealing with the industry as a whole, have chapters on marketing, or relating to it.

I. F. Marcosson:"The Black Golconda", Harpers, 1924.

Anton Mohr:"The Oil War", Harcourt, Brace & Co., 1925.

These books deal more with the world-wide view of petroleum. The last half of the former, however, deals with the American petroleum industry.

"The Mineral Industry: Its Statistics, Technology and Trade during 1926", edited by G. A. Roush and Allison Butts, McGraw Hill, 1927.

The chapter on petroleum is especially valuable for its statistical information, although our statistics have been taken from government publications as far as possible.

The list of general books on the petroleum industry might be continued at some length, but since they give at best only a short chapter or two on marketing, I have not included them here. Another thing against a long bibliography is that anything written on oil is out of date almost before it is published.

GOVERNMENT BULLETINS.

A. DEPARTMENT OF COMMERCE

"Petroleum in 1925" (1927)

"Preliminary Summary of Petroleum Statistics, 1926" (1927)

"Petroleum Statistics" (October 1927)

"Specifications and Tolerances for Liquid-Measuring Devices" (June 1927)

B. REPORTS OF THE FEDERAL TRADE COMMISSION.

"The Price of Gasoline" (1917)

"Pacific Coast Petroleum Industry" (1921, 1922)

"Foreign Ownership in the Petroleum Industry" (1923)

"Prices, Profits and Competition in the Petroleum Industry" (This report submitted to Congress in December 1927, and the newspaper release alone is available at the present time)

OTHER PAMPHLETS

W. C. Platt:"Advertising and the Oil Marketer", published by "National Petroleum News", 1923.

"What Makes the Old Bus Go", published by the American Petroleum Institute, 1927.

"Facts and Figures of the Automobile Industry", published by the National Automobile Chamber of Commerce, 1927.

Numerous leaflets were supplied generously by about thirty leading marketing companies with whom I corresponded. The more important pamphlets were

"The Story of Petroleum" Standard Oil Co. (Ind.). (1926)

"Telling the Store of Pure Oil" The Pure Oil Co. (1927)

"Loreco" Louisiana Oil Refining Corporation. (1927)

"Serving 3000 Communities" Cities Service Company.

"Texaco Star" House organ of the Texas Company (1927)

"Motor Oil Medium" Sales Department organ of the Texas Company.

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TRADE JOURNALS

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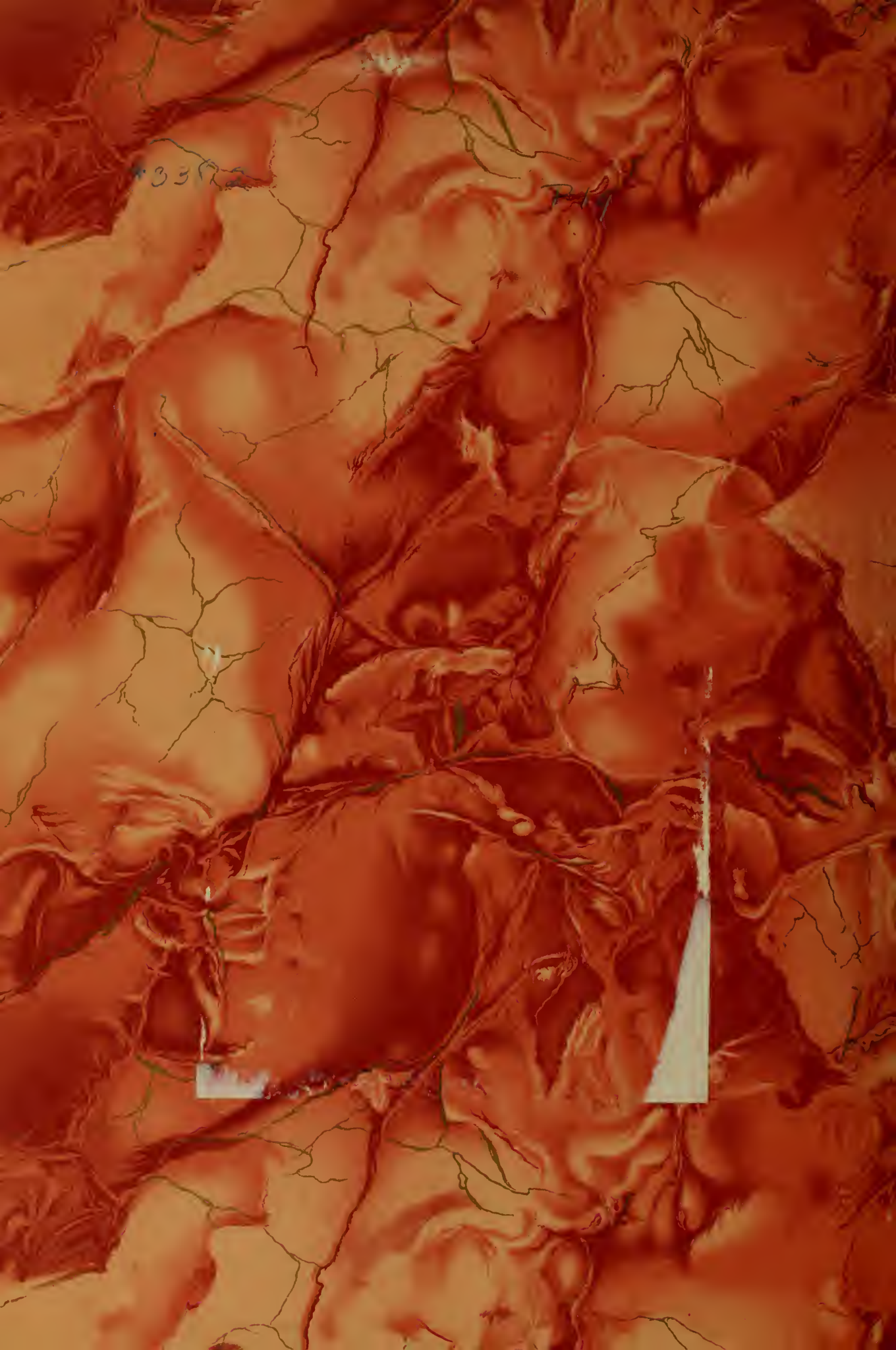
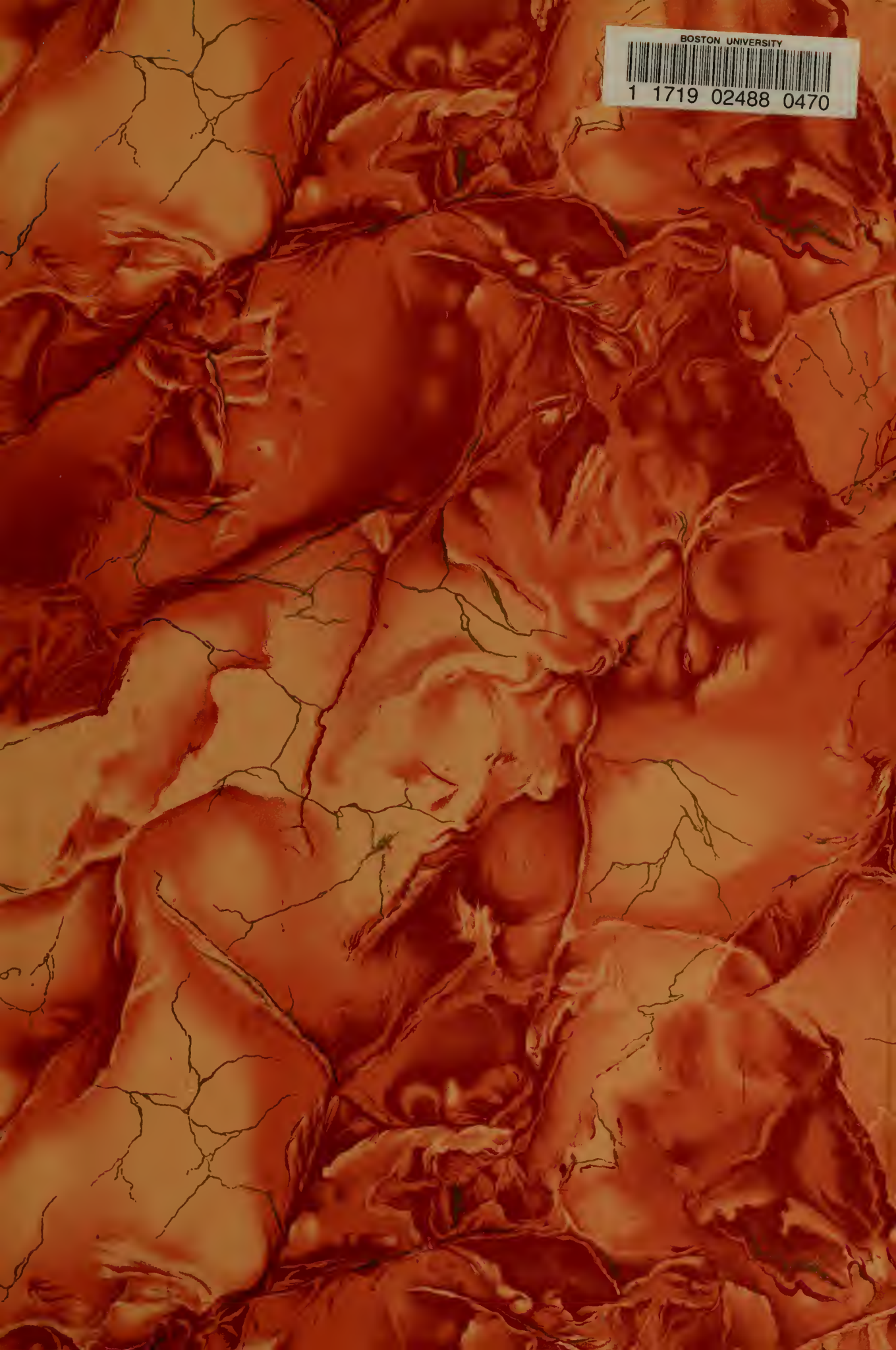
TRADE JOURNALS (Cont.)

"Petroleum Age", published semi-monthly by the Petroleum Age Publishing Co., Chicago, Illinois.

"Petroleum Marketer", published semi-monthly by the Gulf Publishing Company, Tulsa, Oklahoma.

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